SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1908.—Vol. XLII. LONDON, SATURDAY, MARCH 16, 1872. PRICE ..... FIVEPENCE. PER ANNUM, BY POST, £1 4s.

Original Correspondence.

IRONWORKS AND COLLIERIES IN YORKSHIRE.

THE WHARNCLIFFE SILKSTONE COLLIERY—COAL-CUTTING MACHINERY, THE TAIL ROPE, &c.

The largest of our collieries working the finest seam of coal in the Midland field is that known as the Wharncliffe Silkstone, situate about nine miles from Sheffield, in the midst of what was once a pleasant and picturesque district. The scenery and attractions around it are in many respects not excelled by any in the kingdom, there being in front of the works a fine belt of wood, and on the other side the magnificent park attached to the mansion of Wortley, the handsome residence of Lord Wharncliffe. Wortley, Wharncliffe Chase (about the largest in the kingdom), Wharncliffe Crags, and the cave of "The Dragon of Wantley," are of historical and legendary note. The Lodge, with the immense blocks of gritstone lying in confused and singularly-formed heaps, was at one time the home of the celebrated Lady Mary Wortley Montague, and her talented but eccentric son. Taylor, the Water poet, when a self-invited guest at the Lodge, and where he quaffed with more than ordinary relish the "nappy liquor" and venison pie for which it was famed even in those days, most probably whilst journeying from Wakefield passed over some part of the present extensive colliery works. The place has also been rendered still more famous by Addison in No. 71 of the *Spectator*, by the celebrated letter from "James to Betty." Large chimnies, sending forth smoke, blocks of cottages, with rows of coke ovens, now, however, mark the place which was at one time a quiet and sylvan retreat, and where the deer once bounded in unlimited freedom locomotives dart to and fro in fits and jerks, conveying to London and other parts of England the valuable minerals found underlying the Wharncliffe estate.

The proprietors of the colliery have long been noted in South Yorkshire for their desire to promote the introduction of machinery and appliances for raising and drawing coal, with a view to economise manual and horse-power. They have been warm patrons of patentees of coal-cutting machinery, and most of the recent inventions for that purpose have been tested at Wharncliffe, and with regard to which we shall allude more fully hereafter.

There are no less than six shafts connected with the colliery, two drawing the Silkstone coal and one the Parkgate seam, the other three being upcasts. In the two Silkstone shafts there are double-decked cages, No. 1 bringing up four corves at a time, No. 2 two corves, and the Parkgate a single-decked cage, working two corves at a draw. Wire-ropes are used—that in No. 1 pit being flat, 4½ in. broad and ¾ in. thick. In No. 2 and the Parkgate seam the ropes are round and 1¼ in. in diameter. The head gearing is of a substantial character, and the pulleys are of a large size. On the pit bank there is a lamp-room, office for the weighmen, and one of Pooley's large weighing-machines.

There are a larger number of engines at work than at any place, we believe, in South Yorkshire, or, probably, in the entire coal field, where only one colliery is being worked. In No. 1 pit there are a pair of vertical drawing-engines by Davis, of Tipton, with 3 ft. diameter cylinders, in connection with which there are six cylindrical boilers. At No. 2 Silkstone drawing-shaft there are a pair of 24-in. cylinder engines by Pigott and Farrar, of Barnsley, with three ordinary boilers. For working the Parkgate coal there is a drawing-engine, 24-in. cylinder, with three boilers. There are also several engines for driving other machinery for wood sawing, corn, and other purposes.

The Parkgate coal, some 80 yards or so from the surface, is reached after passing through the Joan, Tankersley ironstone Mine, the Flockton thick and thin seams, and is of very good quality. The section is as follows:—

	ft.	in.
House coal	0	10
Steam coal	2	9
Fire-clay	0	6
House coal	1	5 ft. 2 in.

The Silkstone coal is equal to any in the district, and is a great favourite in the London and other southern markets for house and other purposes, producing something like 11,000 ft. of gas and 12 cwts. of coke per ton, with very little sulphur. The average thickness of the seam is about 4 ft. 6 in., giving 2 ft. 4 in. of top coal and 1 ft. 8 in. of bottom, or gas coal. The depth of No. 1 shaft to the Silkstone seam is 180 yards, and to No. 2 drawing-shaft 120 yards. There is some considerable difference in the depth of the upcast and the downcast shafts. The ventilation is produced by means of the ordinary furnace, there being two sets of grates, the fire being 12 ft. by 9 ft.

Great attention is paid to the production of coke, and there are a very large number of ovens constantly kept going. There are several washing-machines, so that the coke is turned out in a good state. Although there are between 100 and 200 ovens at work, yet so large is the demand for coke that a number of new ovens are about to be erected. In the bottoms of the shafts much has been done to save horseflesh, and the colliery was the first in the district to carry out the principle of the tail-rope, and that on an extensive scale, and in that particular may be looked upon as a model worth following, as it has been in one or two instances. In the Parkgate seam there is an 18-in. cylinder engine worked by steam, with Fowler's patent clip pulley, winding the corves along a level 700 yards in length, and having three branches. A train of 12 corves, each containing 7¼ cwts. of coal, passes along the second branch, and on the third branch a train of 32 corves travels along at the rate of more than four miles an hour. A return train of 48 corves, worked by a double-acting steel rope, passes along the entire distance of 700 yards in about seven minutes. Having found the above system so advantageous it was extended to the lower or Silkstone seams, and is now being carried out. A 16-in. diameter cylinder has been put down, forcing the air a distance of 500 yards, to a place where there are a pair of small engines worked by compressed air, which work an endless rope along 400 yards of the roads. To the engines is attached a drum worked by friction-gearing, winding the corves from three stations, the first being 200 yards on the dip, the second 350 yards on the dip, and the third station 500 yards on the dip. A plunger-pump 4 in. in diameter, for raising the water, is also worked by the air-compressor. In the No. 2 Silkstone pit there is an engine of 40-horse power, with two cylinders for drawing the corves along an irregular road nearly 1100 yards in length, on three gradients, two of them varying from 1 in 7 to 1 in 30. Mr. Platts, the able viewer, has invented and set to work a movable pulley, which being attached close to the clip always keeps the ropes quite tight. In connection with the tail-rope there are some other machinery for carrying out the system effectually. There are a pair of engines 2500 yards from the principal drawing-shaft—one on the main level and incline 2400 yards from the point named; another 1200 yards in a north-westerly direction; and a third 1200 yards to the dip. In addition there are a pair of small engines at the top of the principal Silkstone shaft, working to the dip 700 yards, and to the level 1000 yards. Put down with great care by Mr. Platts, the tail-rope has been in the highest degree successful. It may be further stated that there are the usual blacksmiths, carpenters, and enginewrights' shops, worked by steam power, and all of them most complete, no expense having been spared to render them all that could be desired for effectually carrying out the various branches connected with the colliery economically and expeditiously. The number of workpeople employed is close upon 800, and the quantity of coal that can be raised will be upwards of 1400 tons per day, and we may say that in no part of the pits where safety-lamps are deemed necessary is blasting allowed.

The firm—which consists of Mr. R. Baxter (Baxter, Rose, and Norton), London; Mr. G. Walker, Sheffield; Mr. Jeffcock, Cowley Manor House, Sheffield; and Mr. H. Walker (who is also the managing partner)—have about 140 houses close to the pit, with extensive garden allotments, besides a large number at Hoyland Common, Mortomley, and High Green. Everything that is calculated to ensure the welfare of the workpeople and their families is carried out on the most liberal scale. There are schools for the children (boys and girls), a scripture reader, a resident medical man, a clothing club, and flower show. There is also an ambulance for the conveyance of any person from the pit who may be injured (one of which ought to be at most collieries), whilst the company are very liberal contributors to the Sheffield Infirmary.

Having thus noticed the colliery and its surroundings, we turn to what has been done by the firm with regard to coal-cutting machinery. The Wharncliffe Colliery was one of the first to put down the necessary pipes and machinery for conveying air-pressure into the workings. The pick machine was first tried, and then the cutter and lever-arm machine of Messrs. Hurd and Firth. However, no later than Friday last a new machine, patented by Messrs. Gillott and Copley, was tested in the presence of a large number of gentlemen connected with mining operations, amongst them being Mr. Cooper, one of the proprietors of the Roundwood Colliery, and formerly manager for Earl Fitzwilliam; Mr. Smith, agent for Lord Wharncliffe; Mr. Wood, (Corbett and Wood), mining engineer, Sheffield; Mr. E. Teasdale, and Mr. Lawton, Old Silkstone Collieries; Mr. Bass, Sheffield; Mr. Maddison, Woolley; Mr. Howarth, Silkstone Main; Mr. Wilson and Mr. Carr, the Oaks; Mr. Beaumont, Monk Bretton; Mr. Williams, and several other gentlemen from the Cannock Chase Collieries. The coal-cutting machine is of an entirely new character, and consists of two 7-inch cylinders, driven by bevil gearing, and having a horizontal wheel, with cutters fixed in the periphery. The whole is mounted on four wheels, and moves along the face of the coal by means of a wire-rope. The air-cylinder is 15 inches in diameter, giving 50 strokes per minute, the pressure being 20 lbs. to the square inch; and the steam-engine has a 14-inch cylinder, giving 32 strokes per minute. The working was under the superintendence of Mr. Platt, the courteous underviewer, and the work was done in good style. In the first attempt made, some little time since, the machine cut 22½ yards in 62 minutes, including a stoppage of 23 minutes for repairing the road. The following was the work done on Friday last:—

No. 1 bank—twenty-two yards cut in	41	minutes.
No. 2 bank—nine yards	20	"
No. 3 bank—twenty-seven yards	75	"
Total 56 yards, cut in	136	minutes.

The coal had been undercut to an average depth of 3 feet 1 inch, the groove being 3 inches. The gentlemen present were much pleased with the working of the machine, and it was understood that it would be adopted not only at the Wharncliffe, but at other collieries, as its success was admitted by all. There is, therefore, every appearance that coal-cutting machinery will attract the attention of colliery proprietors more than it has yet done, and that before long the machine will supersede holing by the pick at many collieries in various parts of the kingdom.

THE MINES REGULATION BILL.

SIR,—The article on this subject in the Journal of March 2 I regret to have to differ from entirely. The Bill brought before Parliament this session is generally acknowledged to be an improvement on those previously introduced, so that the delay in passing a Mines Regulation Bill until now will have resulted in a positive good. This is a subject which should not be legislated on too hastily, seeing that the workpeople and those concerned in the management of collieries have interested motives in stating their case—the safety of mines too often being made a secondary consideration. The general public, though more disinterested, know too little of mining matters to be able to form correct conclusions on the points at issue. Such men as Lyell, Faraday, Gurney, and others have given their best attention to the subject of preventing colliery explosions: though they had the advantage of possessing great scientific attainments, yet they had failed to produce any practical remedy, or any more potent method of dealing with the fire-damp of coal mines than the present one of simply sweeping it away with currents of air.

It must have been evident to a person of ordinary judgment, on reading the reports of inquests held after colliery explosions of late years, that gross carelessness has very often prevailed, the managers must have been, as you state, almost nonentities, as far as competency is concerned, and that the present methods of conducting coal mines are susceptible of great improvement. Time after time explosions of fire-damp have occurred, resulting from firing shots in the working places, frequently where lamps were in use. And we have heard of men and boys being hurt by explosions of gunpowder, which was lying about carelessly in the mine for any one to tamper with. In other cases we hear of accumulations of gas, and of the currents of air being insufficient to dilute the gas ordinarily produced in the working of coal.

It is only a natural consequence, then, in framing a new Bill that these evils and irregularities should have been duly considered, and are guarded against by prohibiting the use of gunpowder for blasting coal—allowing a limited quantity of powder to be taken into mines at one time. Defective ventilation is sought to be prevented by making managers personally responsible for any act of negligence, or any act showing incompetency in dealing with the dangers peculiar to coal mines.

That certificates of competency for mine agents would be a positive good I have not the least doubt, as the endeavour to obtain certificates would be an incentive to exertion, supineness would not be admissible in acquiring knowledge of the subjects peculiarly relating to mining, whether of a practical or scientific nature. This, I believe, would apply to anyone, however humble in rank, whose mind was bent on attaining this object. Believing myself that no complete system of working and conducting coal mines will ever take place unless compulsory powers are used for the adoption of acknowledged improvements on the questions of machine ventilators, safety lamps, daily inspection, and timbering of mines, examination of machinery, ropes, &c., so as to give reasonable security to those engaged in the working of our mines.

The question of the hours and employment of boys is a difficult one to adjust, taking into account the customs of various districts; but this I believe to be one which will best be arranged by meetings between employers and the workmen to talk over the subject.

March 7. C. V.

THE MINES INSPECTION AMENDMENT BILL—No. VII.

SIR,—It may not improbably be objected that the estimate in my last letter of the cost for insuring against the risk of compensating penalties in respect of those injured by explosions is too low; that the whole amount raised by a charge of four fifths of a farthing per ton would only pay for 200*l.* to the family of each victim of fatal explosions, leaving nothing for those injured but not killed, or for the expenses of management; and it may be feared that far heavier cost would be incurred. I think, however, such fear quite groundless, for, in the first place, no compensatory penalty would be inflicted except the owner and manager failed to prove that they had taken all reasonable means to prevent non-compliance with the precautions directed, while it is certain that the change of law, by inducing greatly increased carefulness, would greatly diminish the number of explosions. Their number has, by increased carefulness, been reduced from 80 to 56 per annum on the average of 10 years, and that, too, with an increasing number of mines, and may be further reduced in number by greater carefulness, and in fatality by withdrawing the men from danger whenever it cannot be otherwise avoided, and especially by diminishing the numbers exposed to risk at the same time, by dividing large mines into sections, thereby limiting the extent of any explosion and the destruction it can cause. In the second place, the full amount of the compensatory penalty would not be awarded in all, or even in most, cases, for in many it would be proved that the explosion has, at least in part, been caused by the foolhardy recklessness of the sufferer himself, for which it would be unjust to hold the manager solely to blame. I am, therefore, very confident that the amount I estimated will be amply sufficient to pay for all compensations for death or injury resulting from explosions, diminished both in number and in fatality, as they certainly would be if it be made much more costly to incur risk of life than to guard against it.

I am, of course, quite aware that it must cause both cost and inconvenience to divide large mines into sections, so that an explosion in one part may not endanger those working in another, and I shall be rather disappointed if I am not told that it is wholly impracticable, and even impossible. I have, however, in so many instances heard practical men assert that to be impossible that I knew had been done, and have even known the same man himself actually do one year what he had previously declared to be wholly impracticable, that I for one pay little attention to such predictions. With few exceptions, where there's a will there's a way; I trust, therefore, that the recommendation of the Select Committee of the House of Commons in 1867 will be adopted, viz.:—

That it is expedient to provide that it shall not be lawful to employ more than 100 persons in any mine unless such mine be divided into separate districts or panels, in such manner as that each such separate district or panel shall have one or more independent intake and return air-way from the main return, or upcast. That in mines so divided not more than 100 persons shall be employed in any separate district or panel; but that power to dispense with the strict and immediate application of this recommendation should be vested in the Secretary of State.

Though the division of mines into districts or panels will limit the destructiveness of explosions, while more perfect ventilation and closer attention to safety-lamps will render them less frequent, it will need such constant watchfulness always to detect the presence of fire-damp in time to withdraw the men from danger, that it is of the greatest importance that the best means should be employed for giving timely warning. It is true that if safety-lamps be carefully observed the presence of fire-damp may be known, and the Bill provides that no workman shall go to work until the air in the working places and the road opening thereto have been examined and reported safe. This proper, and indeed necessary, precaution is very generally adopted, with excellent effect, but its observance ought to be universal, as well as those directing that whenever it is found that the air of any mine, or of part of it, becomes dangerous every workman shall be withdrawn therefrom, and not re-admitted until the air has been again examined, and found not to be dangerous. It is true that many believe that explosions are never caused by safety-lamps which are in perfect order, even if the air has become explosive, but allowing that opinion to be correct, which may well be doubted, it is so difficult to secure at all times the perfect condition of many lamps that it would not be right to risk even a hundred lives, and sometimes far more are risked, upon the chance of every one out of a hundred lamps being in perfect condition: the only real security is withdrawing the men whenever, either from temporary deficiency of ventilation or unusual extrication of fire-damp, the air becomes explosive. The observance of the precautions will, no doubt, prevent many disasters, but it would be far more effectual if in addition to observing the effect of fire-damp on the lamp its presence were indicated by instruments which would give an alarm, without needing to be constantly watched, and which would make the danger known, not only at the spot where it exists but also to the officers of the mine. Mr. G. F. Ansell has invented a very ingenious fire-damp indicator, that will, he says, show the proportion of fire-damp in the air, both by inspection on the spot and also give the alarm at any place by electric signal, whenever the proportion reaches any degree at which

the instrument is set, so that warning may be given when the air approaches, though it has not reached, the explosive point. It is very probable that other means of denoting approaching danger will be contrived, and their value can hardly be overestimated: they will be as useful in mines as safety-valves are to steam-boilers, and there should be power to direct that instruments so useful should be used, and their indications, as well as those of the barometer, regularly observed and recorded.

Another precaution I have long wished should be adopted is proposed in the Bill—namely, that the roof and sides of every working place shall be made secure, and that a person shall not travel or work in any such travelling road or working place which is not so made secure. It has long been known that accidents from falls of roof or coal, by which nearly two-fifths of those killed by coal mine accidents are now destroyed, are far less frequent in the mines of the northern districts than the average, and it is believed that the great difference is chiefly, though perhaps not entirely, owing to its being the custom in the North, but not in England generally, for the mine owners to employ men for the special duty of propping and timbering, instead of leaving it to be done by the pitmen themselves. Mr. Wynne, in his evidence before the Committee, says that by inducing the owners of his district to set props at not less than 6 ft. apart, instead of only where apparently necessary, as was before customary, fatal accidents from falls of roof have been reduced 40 per cent. A reduction of 40 per cent. upon 416 lives now annually lost by falls of roof and coal would be a saving of 166 lives a year, or three a week, and there can by no doubt that this service, upon which safety so much depends, will be better done, more skilfully, as well as more carefully, by men specially employed to do it than if left to the pitmen, who must be less practised, and who are likely to begrudge the time occupied in work for which they receive no direct payment. These same men, who would neglect their own and others safety to earn a little more money, will be very careful not to allow it to be neglected by others; and if, as would be just, fair allowance be made in the rate of earnings paid, to compensate the owners for the cost of work from which the pitmen are to be relieved, this very useful precaution need not add to the cost of getting coal. I trust, therefore, this very valuable provision of the Bill will be cordially supported.

PHILO.

THE COAL INDUSTRY OF SILESIA, AND THE CHANGES OF THE COAL PRICES DURING THE LAST YEAR.

SIR,—In order to gain a clear understanding of the importance of the changes which took place during last year in the price of Silesian coals, it is advisable first to take a review of the price of coals in the previous years. After the statistics of the ministerial "Zeitschrift für Berg, Hutten und Salinenwesen," the average price of all the coal produced in Upper Silesia in the district of Oppeln, of which Upper Silesia forms the principal part, was as follows:—

In 1861	3·64 sh.	per Eng. ton.	In 1866	3·84 sh.	per Eng. ton.
1862	3·36	" "	1867	3·78	" "
1863	3·48	" "	1868	4·10	" "
1864	3·56	" "	1869	4·51	" "
1865	3·72	" "	1870	4·78	" "

The average price for 1871 has not yet been officially ascertained, but it is known that at the Königsgrube, the largest of all the Silesian coal mines, it has been 6 sh. per ton; as these coals are, however, on account of their superior quality a little dearer than most other coals, the average price for the whole production will only be about 5·80 sh. per ton. The price of coals had, therefore, risen in 1871 almost as much as during the previous ten years from 1860 to 1870; but, as considerable as this advance is, still it does not nearly represent the real advance which took place last year, for the coals only became dearer during the latter part, while in the first part the old prices were still paid, and for this reason, of course, the average price for the year appears much lower than the price really paid during the last half-year. Besides this, the large coal consumers and dealers make at the beginning of the year contracts for their probable wants during the ensuing twelve months, or the whole or a part of the production of a mine. More visible is the whole extent of the advance from the following official quotations of the Königsgrube.

Average price for January, 1871, 5·44 sh. per English ton; for December, 7·68 sh.; for January, 1872, 8·72 sh.; but nearly all who were under the necessity of buying coals at the end of last or the beginning of this year have paid still higher prices than these. As the price of the coals of Königsgrube is fixed by the Royal Mining Office, which very slowly raised the prices, and as coals were getting dearer everywhere, many orders were sent to the administrators of the royal mines, but only a portion could be executed. At public auctions for large coals even 16 sh. per ton at the works has been paid. The coal production of the district of Oppeln has been:—

In 1861	2,500,000	tons Eng.	In 1867	4,600,000	tons Eng.
1862	3,050,000	"	1868	5,300,000	"
1863	3,450,000	"	1869	5,500,000	"
1864	3,850,000	"	1870	5,835,000	"
1865	4,300,000	"	1871	6,200,000	"
1866	4,000,000	"			

the average price having varied during this time from 3·6 sh. to 5·80 sh. per ton. From this it appears that during the last ten years the average increase of production has been 8·7 per cent. annually; in the years 1861-1865, 14·5 per cent.; and from 1865 to 1870 only 5·02 per cent.; while the price has on the average risen 2·67 per cent. No material advance took place during the first six years, but in the last four years, 1867-1870, there was an advance of 8·14 per cent. From 1870-71 coals have risen 21·4 per cent., and up to January, 1872, about 75 per cent. The cause thereof is that, in consequence of the industrial development, and the high coal prices from 1857 to 1858, all coal mine owners had endeavoured to extend their works as much as possible, but before the greater part had been brought to the intended purpose pig-iron suddenly fell 50 per cent. in price. The spelter production made likewise a retrograde movement, and the result was an increased production and a diminished consumption; the consequence was that a great many furnaces were blown out, and coals fell rapidly in price. Great quantities were at that time sold under cost price, and all new works were discontinued; nobody had the courage to enter into new undertakings, but still the production increased. In order to obviate this a new market was sought after and found in Berlin and North-eastern Germany—after the railways had rendered assistance by reducing their tariff—where hitherto English coals had enjoyed the monopoly. In the year 1862 the consumption of Upper Silesian coal in Berlin was only one quarter of the whole consumption; during the following years the Silesian coal not only gained the upper hand in the Berlin market, but penetrated far beyond Berlin. The blockade of the Baltic and North Sea ports during the Danish war prevented the importation of English coals, and opened to the Silesian coals the entry into the towns on the Baltic. Their excellent quality for ordinary household purposes, their comparatively great purity and small quantity of ashes, have mainly contributed in keeping their place against all English coals, except gas coals and some other English coals specially required for technical purposes.

In 1867 the Austrian industry commenced to make progress; the sale of the Silesian coals grew rapidly in the South, as it was found that the Austrian coal mines near Ostrau, in Moravia, did not suffice for the demands of the Vienna and Pesth markets. In spite of the extension of the territory the coal production increased only about 5 per. cent. annually; this, at the time of such a rapid development of industry would hardly have sufficed for the demand of a constantly extending territory if the consumption at the place of production had not been as much as possible reduced. The going back of the zinc production, and the improvements made in the zinc and iron manufacture, rendered it possible that, although the production was not materially increasing, still a much larger quantity became every year available for exportation. This, however, ceased as soon as, after the French war, the industry of Upper Silesia, assisted by the acquisitions of modern technical experience, suddenly commenced to extend the works, and thereby rapidly caused a rise in the price of coal.

It would be a natural question to ask why so little was done at the coal mines at that time in comparison with former years, when the conditions were not so favourable? The only answer thereto is, that the works undertaken for the further opening of the coal fields had been too much restricted during the preceding years, and that no new mines had been opened at all; the consequence was that the so suddenly increased demand caused the coal fields to be exhausted before the owners became aware of it.

In the year 1870 preparatory works had again been commenced for opening the coal mines, but, even when the seams lie at a moderate depth, five to six years pass generally in Silesia before a large production is obtained. There are even deep-lying seams which were opened more than ten years ago, and up to the present day no great quantity has been brought to the surface. At the termination of the French war the demand in the whole territory provided with Silesian coals—extending over about 80,000 English square miles—considerably increased, and as more than 1400 English miles of new railways were opening districts which for the greater part had not yet been able to take the coals from Silesia, the administrations of the mines were often forced to confess to the manufacturers the impossibility of supplying them; but as they required the coal under all circumstances they had to pay higher prices than had ever before obtained either in Silesia or the West of Germany. The largest profits were of course enjoyed by those dealers who had made contracts at the low prices at the beginning of the year, especially has this been done in the counties of Kattowitz and Mislowitz, where it has been nothing rare for dealers to sell the coals at double the price paid for them. The fiscal mines (the property of the Government) kept back as long as possible from raising their prices, and proceeded very timidly and cautiously in order not to lose the North German market, but all this was in vain. The applications for coals became so numerous at the two royal mines, that only a very small part thereof could be satisfied. By waiting longer nothing would have been obtained but that the dealers' profits would have been enormously increased without having any influence upon the bulk of the coal trade. So, for instance, the administration of the Königsgrube received many complaints from some of their customers, that they had to pay to the dealers 14 sh. to 16 sh. per ton for large coals, while the dealers were only charged 10 sh. per ton.

Just as little would any other administration have been able during August, September, October, and November to keep the prices down for the purpose of retaining the usual territory. On one side it is contended that this enormous price is principally due to the machinations of the coal dealers, and the way the auctions are arranged by the coal mine owners and administrations, while the other side affirms that none of the fortunes of those interested in the coal trade would have sufficed to change the tendency of the coal prices materially for any length of time in a market such as the Silesian coal trade commands, extending over such a vast territory. In the beginning of December, 1871, a retrograde movement appeared to set in, but winter surprising Silesia in an unexpectedly early and very cold manner, coals came again into greater demand, and prices again became firmer. But as January was extremely mild, and as the demand from the distillers and sugar refineries, on account of the bad crop of potatoes and beetroot, proved to be very little, the stocks in all the coal yards, and partly the mines, increased, and the market prices began to fall. The most sensitive market showed itself to be Berlin. When Silesian large coals cost 14 sh. to 16 sh. at the mine, the corresponding price at Berlin is 28 sh. to 30 sh. per ton, and at this price English and Westphalian coals, as well as Bohemian brown coals, are able to compete with the Silesian coals; this competition does not limit itself to Berlin, but extends itself over a tract of land many miles broad and long, where millions of hundredweights of coal are burnt. There remains now the question, can Upper Silesia do without this vast territory? If the south—*i.e.*, Austria—can fully replace these customers, for which Silesia need not fear a serious competition from any quarter, then it has no cause to lower the prices; if it cannot lose it the necessary sacrifices must be made to retain it.

In well-informed circles the opinion prevails that the loss of the territory named cannot be borne, and that prices will recede, therefore only to such an extent as to prevent the importation of English and Westphalian coals; a return to the former prices is considered out of all probability, at least for the next few years, as the demand is increasing so rapidly at present that with the greatest exertions the production will not be able to keep equal pace with it. Of course the most important fact will be the price of iron.

O. B.

Breslau, March 5.

VARIABLE EXPANSION GEAR FOR WINDING ENGINES.

SIR,—Upon several occasions recently I have seen references in the *Mining Journal* to improvements in variable expansion gear for winding-engines, especially to those of Mr. Lucien Guinotte, of Mariemont, Belgium, and of Mr. Audemar, of the Blanzy mines, Saone et-Loire. Not being engaged in connection with collieries, I have no means of knowing whether it is usual or unusual to employ variable cut-offs at collieries, but I can hardly think that colliery engineers are behind the members of the profession connected with other branches of industry in the adoption of so useful and economic a contrivance. With regard to the two inventions named, I can safely say that it would be possible to find in Great Britain, if not at collieries, variable cut-off gear quite as efficient as that described, and the first cost of which would be much lower.

It would be of very general interest if some of your correspondents connected with colliery engineering would state the description of variable expansion gear, if any, used about collieries, and the first cost of attaching it. If any objections have been urged against this class of machinery, I should be glad to learn what they were, for I cannot understand that there are any objections which could not be overcome, so as to to render high-pressure engines, and all the most economic machinery, applicable to pumping and winding purposes. I believe that Mr. Thomas Craddock proposed the use of high and low-pressure combined engines, and variable expansion gear in connection with colliery engines some years since, and I should like to know to what extent his suggestions were adopted.

March 11.

INVENTOR.

LEGITIMATE MINING—A WORD TO INVESTORS.

SIR,—We hear a great deal, and no doubt many of us say a great deal more, about legitimate mining, and are, it is to be presumed, very frequent impressed with just and definite ideas of its value to all parties concerned, were its principles universally adopted and strenuously maintained. There is a strong and sometimes a vivid apprehension of the benefits which a rigid observance and practical application of its principles would confer, especially on the adventurer. Yet, at the same time, it is to be feared that too many who entertain these views, and endorse them in theory, are not careful to conform to them in practice. If this be not directly and unqualifiedly the case, it is manifest in the schemes they too frequently lend their aid and influence to support, and in such a way that the prefix "legitimate" can never be legitimately applied to such enterprises. Science is not unfrequently invoked to its aid, and with apparent unsophisticated earnestness, as if that mere abstraction, or practically relative term, was the panacea for all the ills by which mining is afflicted, or to which it is subject.

The complicated ramifications of mining, looked at through the vista of mere possibilities, would seem to admit of numerous improvements from external sources; but a more intimate acquaintance with its physiology and peculiar mechanism shows how difficult a thing radical improvements in mining are to perfect and apply. What is possible and feasible is not always proper or desirable, and what is proper and desirable is not always practicable or possible. This is a phase of mining contingent on a variety of circumstances. There are a number of considerations to be referred to and judged of before many suggested changes can be adopted. There are conditions under which many popular improvements are not generally applicable, because of local differences and peculiarities, and hence that which operates most beneficially in some cases would be highly injurious in others, and prove in practice worse than useless.

The first idea which naturally suggests itself to the mind respecting suggested improvements almost invariably is, will it pay? Such a proviso, it will readily be admitted, is suggestive as well as pertinent—suggestive that economy is the standard to which all proposed changes should be referred, and very properly so, because economy is the soul of mining, more so than of any other enterprise. Its numerous and complicated ramifications, expensive in all their practical details, render it delicately sensitive and responsive to its exercise, and alarmingly so when that indispensable essential to success is absent. Economy in its relation to mining, I have already said, is the standard to which every practical consideration should be referred, always bearing in mind that the sum of the difference in time between two proposed methods is to be appraised at its proper value. If economy, then, is the soul of mining it vitally affects in its healthy action the entire organisation, whatever its extent may be. And that this is the case cannot be doubted, since the elasticity of its springs of action are regulated by pecuniary results. If heavy losses accrue from injudicious investments in any individual enterprise the whole body of mining is as sensibly affected thereby as a living organism would be by the derangement of any of its parts vitally necessary to its own perfect action. A just, comprehensive, and explicit definition of economy I take to be, in its application to mining, the accomplishment of the greatest amount of effective work in the shortest space of time, and with the smallest possible outlay compatible with the general design, and conducive to the most approved pecuniary results; and this, of course, involves a knowledge of when and how to apply its principles—*i. e.*, when to be stringent and when to be liberal, for stringency is not always compatible with true economy, any more than a generous outlay is proof of extravagance; consequently, the knowledge of what constitutes true economy implies the knowledge of when and how to apply those measures which are alone conducive to its object. And this again, it is almost needless to say, includes a minute and comprehensive knowledge of the enterprise or business engaged in, and to the success of which, whatever it may be, it is so essential an element.

At this point we are confronted by a proposition forcibly suggested by our own mind—is it possible for true economy to be exercised in all the intricacies, perplexities, and abstruse ramifications of mining by anyone not having a practical and experimental acquaintance with it in all its branches, and in their every department? And if the necessary qualifications be wanting, who is competent to affirm, besides the practically educated mining engineer, whether or not the results arrived at are what they should have been; as well as whether the general working of the principles adopted be found conducive as the best means to accomplish or compass the objects proposed?

There are various classes of mines, both as to their extent and remunerative qualities, and to exercise economy in respect of either their fundamental outline should be well comprehended and understood, so that at the outset those entrusted with their development might be able to determine, at least approximately, and decide upon the most economical and effectual mode of operations, and the ratio of probable profits to the necessary outlay. The conduct of mining in its general features, both of outline and detail, as well as in its object, has much in common with military tactics, and the art of war it is well known may be unexceptionable in theory, and very faulty in practice, according as the movements and design of the forces apposing are correctly or erroneously apprehended. The science and success of mining in individual cases are involved essentially in a consistent outline, and a just appreciation of the physiological features of the section of ground about to be subjected to the experiment of mining, and in a proper application of means to the end proposed, always providing that such means be devised and controlled by two leading considerations—expedition and economy. The art which distinguishes between the various classes of mines as to their prospects for remuneration and permanency, or *vice versa*, is very essential to success, and one by which economy is to a great degree transferred from the region of thought and anxiety of the mind of the individual operator to the mechanism of the system itself, whose harmonious and reciprocating influences from the perfection and compass of its arrangements conduce to economy and expedition necessarily. It will be observed that I have been using the term "economy" as synonomous with that of "legitimate" in mining. I have done so because so far I have considered it more definite and effective in expression, and from its not being quite so hackneyed a phrase. I shall, however, change from one term to the other as necessity may seem to require and justify the change, as in different connections the terms may vary, and alternately transcend each other in point and perspicuity. If economy is essential to the success of any individual mine it is essential to all mines, and at all times, as if success results from a lax system of mining, or from not being sufficiently intelligible to be appropriately termed a system, how much greater would have been the success if a judicious system had been adopted and pursued. It is, therefore, evident that to develope itself in all its beneficial and pleasing proportions the vital principles and facts by which its action and the results thereof are inevitably affected have to be consulted and observed with rigid business tenacity at the most incipient stages of any and every individual enterprise, as well as at all periods of their after growth and development, and thus it relates in a very especial manner to the selection of individual mines, and the appreciation with which they are regarded on the ground of merit, and the intelligibility and solidity of the basis upon which the merits are hypothecated, as well as to the means which may or should be employed to produce the results anticipated. Mining enterprises naturally divide themselves into two great classes—the "remunerative" and the "unremunerative;" and each of these, again, into two sub-classes—the first into the "substantial" and "permanently remunerative" order, and the second into the "satisfactorily progressive" and the "dubiously speculative" order of mines. To distinguish between the sub-divisions of the first order is of the greatest importance, and a fundamental principle of legitimate mining, and one deserving of much more attention than is ordinarily paid to it. The evils which arise from confounding these two classes of mines, or from failing to discriminate between them, are enormous, and much to be deprecated, because amongst other things it inflicts an injury upon the whole industry which cannot be redressed, as well as upon the individual enterprise. To treat these two classes of mines with a similarity of operations would be to inflict an irreparable injury upon one or the other, and would be proof presumptive of official incapacity to successfully develope either.

It is surprising that there should be such a lack of discrimination regarding mines, and it can only be accounted for from the fact that those of the sensational class are susceptible of a brilliant display, independently of the exercise of either much skill or much capital, and individual purposes are very frequently much better subserved than they could possibly be by adopting those measures which are conducive alike to the whole system of mining and its community of interests.

The antithesis of the old adage, "Good wine needs no bush," is that the spurious requires something not their own to recommend them. The moral of this is pertinently applicable to mining in the present day, when the fancy is exercised more, and esteemed in its efforts at constructing gorgeous fabrics without the necessary material, than the reason, judgment, and facts are consulted as lights and guides in a most devious and perplexing pursuit. However desirable it may be to realise large returns from small investments, it will always be found a dangerous experiment to transpose the exception which proves the rule and the rule itself. Sensational mines may be mined as legitimately as the permanent and more solid class of mining investments; but it is equally flagrant, inconsistent, and reprehensible to attribute permanency to the former class of mines as it would be to credit the latter with the "flash" or sensational enterprises. Experience may be esteemed a stern teacher, and so it is; but its monitions, though unpalatable and very frequently opposed to the designs and interests of individuals, will be found much more conducive to pecuniary health and prosperity than the creations of fancy, generally pleasing to the inexperienced, but as unsubstantial as they are agreeable, and, which, in aiming at the wonderful, unites effects to causes which never operated, and do not exist; or, in other words, effects which are the result of other causes are attributed to causes which did not produce them. The question, therefore, how to distinguish between the two is of the utmost importance as effecting satisfactory issues, and one of the elements of mining in which science is especially involved. The line of demarcation between the two classes of mines is very pronounced and self-asserting to all but those whose faculties are absorbed by other motives and other designs, abstracted from and impervious to ordinary impressions, absorbed in an excess of enthusiasm kindled and supported by an excitement produced and sustained (may it not be truthfully said) by more than one questionable consideration. What has happened, it may be asked,

to mining that its old landmarks should be swept away, and the philosophy of experience, the soundest philosophy of all, be required to give place to popular fancies, originated in ignorance, and insidiously propagated in plausible theories, presented to the minds of the uninitiated for purposes of deception—pleasing to betray—gilded bubbles artistically floated before the mental vision, until, intoxicated by the gorgeousness of the changing colours, the mind gives way and abandons itself to their pursuit, and follows on with enthusiasm unabated until, grasping the exhilirating object of its ambition, it is found to have been a phantom—an airy nothing, collapsing at the touch, and melting into thin air; and its gorgeous and fascinating colours found at last to be nothing better than the prismatic reflection of decomposed light, resembling the colours of the rainbow? I could readily descend to particulars, but it would be regarded as gratuitous, invidious, and probably in some instances personal, and, therefore, affect me injuriously as an individual, without adding to the beneficial design of this communication, the object of which is to protect mining from imminent but unnecessary obloquy, and those most deeply interested in its success from outrageous sacrifices and pungent disappointments. This duly effected, the other class of mines, subdivided into the "satisfactorily progressive" and the "dubiously speculative" order, would in due course receive that attention, both fostering and critical, which their respective merits and peculiar features entitled them to.

ROBERT KNAPP.

Ellsworth, Nye County, Nevada, Feb. 7.

CAN OUR DEEP CORNISH MINES BE PROFITABLY WORKED? "VAN" VERSUS "DOLCOATH."

SIR,—The prominent and most strongly developed feature of our Exchanges is the discrimination which the public evince in their selection of securities for investment. Capitalists are evidently acquiring an increased power of discernment, and it is manifest to all practically acquainted with our stock and share markets that a growing desire prevails to embark into properties possessing inherent merits rather than fancy, speculative undertakings, however fascinating may be the ephemeral premiums which they command at their birth. Home mines and mineral properties—the back-bone of "Old England"—foreign Government bonds, British railways, and sound commercial undertakings vie with each other in attracting attention, and day by day there is a run in favour of one or other particular stock or share, whilst, on the whole, the resuscitation of prices, consequent on the Alabama collapse, quietly and satisfactorily proceeds.

What would England be without its mines, especially of coal and iron, and, next in importance, those of lead and tin? We are, indeed, all of us blessed in our noble inheritence of free institutions, vast wealth, scientific attainments, and elevated and extended education and knowledge. Bacon, Newton, and Faraday place us first and foremost in the sciences; Trevithick, Stephenson, and Locke stand out the greatest of our engineers; while our energy and industry, coupled with our command of money, metals, minerals, and freedom, suffice to clothe the world, to cover the seas with ships, and the land with the means of locomotion. Again, we have a community fully employed and well remunerated: the trade and commerce of the country prosperous and expansive, with an absence of anything like an approach to heavy taxation on all the articles of sustenance, clothing, and the necessaries, nay luxuries, of life.

At the present date the two superlatively best mines, otherwise than those of coal or iron, are the Van, in Montgomeryshire, and the Dolcoath, in Cornwall. The first is a lead mine, and the latter yields tin. These properties consist of 15,000 and 4296 shares respectively, and the quoted prices thereof are 55*l.* and 85*l.* The Van, therefore, sells for 825,000*l.*, and Dolcoath for 365,000*l.* The yields and profits of the Van have been as follows:—During the past six months Seaham's shaft has been sunk 25½ fms.. The Chairman remarked at the last half-yearly meeting "I call your attention to the amount standing to the credit of the capital account: you will find that it amounts to 4303*l.* 15s. 5d.; out of that is required 3000*l.* for new machinery, cottages," &c. The estimated sales of lead ore during the next three months is 500 tons, and of blende 150 tons, for each month of four weeks. This company has paid in dividends—1869, 12,900*l.*; 1870, 30,000*l.*; and 1871, 36,000*l.*: total, 78,000*l.*, nearly 7000*l.* over the whole capital, including the premium on the new shares. The Secretary has furnished a calculation of the lead and blende ores sold:—

Sales of lead ore in the first half of 1869, 830 tons, realising 11,198*l.* 15s., or an average of 13*l.* 9s. 9½*d.* per ton. Second half, 450 tons, realising 19,356*l.* 5s., or an average of 13*l.* 7s. per ton. First half of 1870 we sold 2025 tons, realising 26,708*l.* 10s., or an average of 13*l.* 3s. 9¼*d.* per ton. Second half, 2445 tons, realising 31,331*l.*, or an average of 12*l.* 16s. 3½*d.* per ton. In the first half of 1871 we sold 2600 tons, realising 32,688*l.* 10s., or an average of 12*l.* 11s. 5¼*d.* per ton. In the second half, 2730 tons, realising 34,816*l.* 5s., or an average of 12*l.* 15s. 5½*d.* per ton. The total sales have amounted to 12,080 tons, realising 156,097*l.* 5s., or an average of 12*l.* 18s. 5*d.* per ton. In the first half of 1869 there were 120 tons of blende sold, for 393*l.*, or an average of 3*l.* 5s. 6*d.* per ton. In the second half (five months) 200 tons, for 700*l.*, or an average of 3*l.* 10s. per ton. In the first half of 1870 there were sold 100 tons, for 350*l.*, or an average of 3*l.* 10s. per ton. In the second half 450 tons, for 1342*l.* 10s., or an average of 2*l.* 19s. 8*d.* per ton. In the first half of 1871 there were sold 600 tons, for 1900*l.*, or an average of 3*l.* 3s. 4*d.* per ton. In the second half 700 tons, for 2693*l.*, or an average of 3*l.* 16s. 11½*d* per ton. The lead and blende markets continue firm. The Van railway fully carries out the purposes for which it was intended. You will thus perceive that the Van is capable of returning 500 tons of lead and 150 tons of blende monthly, yielding a revenue of about 85,0 0*l.* annually."

In the year 1860 the bottom level at Dolcoath was the 266, about 300 fms. from surface. The produce for that year was 961 tons of black tin and 433 tons of copper ore; the gross sum realised was 68,400*l.*, which gave profits of 16,826*l.*, the dividend in December being 10*l.* per share, while the price stood at 535*l.*, or (say) 191,500*l.* for the entirety. In your valuable Journal of Jan. 5, 1861, the aggregate dividend is stated to be 601*l.* 10s. per 355th share, or 215,337*l.* The average price of Dolcoath black tin for the year 1860 was 80*l.* 4s. per ton, and the average price received for the produce of January and February, 1861, was only 72*l.* per ton. The dividend December, 1860, was 10*l.*; February, 1861, 9*l.*; and April, 8*l.* per share; and at the latter date the market value had receded from 535*l.* in January, to 340*l.* per 358th share; but the price soon rallied to 500*l.* Refined tin in January, 1861, was 134*l.* per ton, in February 130*l.*, and in April 122*l.* The fall between the two latter dates lessened the profits on the two months' produce by 1055*l.*

Dolcoath Mine since the year 1860, when the deepest level was the 266, must have sold about 800,000*l.* worth of tin; and, pray, what has been the gains over the eleven to twelve years? Looking over the columns of the *Mining Journal* I find the dividend to be 91*l.* 9s. 2d. per 4296th share, or 392,905*l.*, of which sum 215,337*l.* was divided up to December, 1860. The gains, therefore, over the eleven years, to December, 1871, were 177,568*l.*, equal to 16,142*l.* annually, or 8*l.* 8s. 6d. per cent. on the market value of shares in January, 1861 (535*l.* per 358th share), and 4*l.* 8s. per cent. on 85*l.* per 4296th share, the present market value. To make these dividends four-fifths of a million sterling of black tin had to be produced and brought to market, whilst the deepest level in the mine is at this date 302 fathoms under the adit, just 36 fathoms deeper than when I visited the mine in the year 1860. This is sinking with a vengeance—that is, 3 fms. 1 ft. 7½ in. a year. What would our contractors and engineers say to such speed in opening out the lodes of the richest tin mine in the known world? Happily there is little water in the mine, but few practical impediments to overcome, and no end to the stores of ore. The only requisites needed are engineering skill and efficient machinery to cut open the ground, stope away the backs, and bring the ores to surface. In 1860 the cost of dressing black tin was 5*l.* 14s. per ton, and that of stamping and burning-houses for coals, enginemen, and wear and tear of machinery, 3*l.* 19s. more—say, adding carting and conveyance to smelters, 10*l.* 7s. per ton as the gross charges attending the manipulation, dressing, and sale of the produce after its discharge from underground to surface. If this was the expense in 1860 it ought to be less at the present time, as large sums of money have been expended in extending and perfecting the dressing appliances and varied mechanism in use.

We are are led to these remarks from numerous applications for information from almost every quarter of England, and it is rather amusing to analise the various views of my numerous correspondents. One thinks that, doing well, the ship should be left to pursue her course undisturbed, and no greater industry, skill, or mechanical power introduced into the concern. Another thinks that the dividends should be "trigged" at their present amount. The progress of operations he thinks at Dolcoath can be handled just as easily and effectually as one of the Cornish steam-engines can be stopped through the introduction of a wire no bigger than a stocking needle, which, in Cornish phraseology, "triggs" the machine. Pray let me ask my various correspondents if they ever knew of a banker closing his doors at two o'clock whilst others kept open till four, because he was satisfied with his gains; or that a jeweller put up his shutters at two, instead of remaining open till eight o'clock, because he "trigged" his gains at 40,000*l.*, whilst his trade admitted of his making 80,000*l.* a year? To end all questions at once regarding Dolcoath Mine, I may just observe, in conclusion, that the Mont Cenis Tunnel, the Suez Canal, the North London Railway, and thousands of valuable engineering and mechanical constructions, would never have been perfected and rendered valuable properties had the contractors and engineers been content with sinking shafts and opening out a section of a lode 36 fms. in depth, in a period of 11 years. If 50 fms. in depth be attained, and the lodes opened out in five distinct levels, the ground stoped away, and the produce brought to market during the coming seven or eight years, then, in my opinion, the gains will exceed the present market value of the property twofold, for the veins exhibit no approach to even defined exhaustion as depth is attained. Hence industry and skill are essentially required. I have no desire to question the management or the value of the Dolcoath "executive" and "mine," but as I am daily consulted as a mining engineer, I endeavour to acquire correct intelligence and views as I proceed along. I have for years advocated the Dolcoath Mine, and many a shareholder has embarked through my advice and writings; still, I shall pause in further advocating investment therein if it become an acknowledged fact that engineering skill and practical mining can only sink 3 fms. 1 ft. 7½ in. a-year! Gold can be purchased at too dear a price, and as I do not think that the value of tin will rule higher during the ensuing 11 years than during the past 11 years, I prefer keeping my "tin" in my own pocket to embarking in Dolcoath Mine to raise the "tin" at 85*l.* per 4296 share, unless more speed can be introduced in sinking! It is fudge to entertain the notion that engineering skill and machinery cannot discharge an increased quantity of produce—from this, the South Caradon, the Crofties, Roskears, and many another mine which chiefly benefit Cornwall alone. The facts are embodied in one question—Are the mines worked within the jurisdiction of the Stannary Courts of Cornwall and Devon to be regarded as the special properties and privileges of the two counties, or otherwise developed for the benefit and sole advantage of the shareholders?

R. TREDINNICK,
Consulting Mining Engineer.

3, *Crown-court, Threadneedle-street, City, March* 12.

MINERALOGY OF UTAH.

SIR,—I have read with very great interest your valuable extract of Prof. Silliman's paper, "The Geology of Utah," in the Supplement to the Journal of March 9, for at the time of its appearance I was occupied with an investigation of the same minerals. I could corroborate, if it were necessary, nearly all the statements of the learned American professor, and every observer will agree with him that the desulphurising process which these ores have undergone in Nature is one of the most remarkable features ever presented to the mineralogist. The first thing that strikes the chemist in the analysis of these Utah ores is the comparative absence of sulphur, and the existence of large masses of a more or less compact amorphous yellow substance, which Prof. Silliman seems to look upon as principally composed of antimonial ochre impregnating cerusite (carbonate of lead). I have particularly examined this curious ochreous substance, and find a mere trace of antimony in it; it is chiefly formed of *oxide of lead*, containing sulphate of lead with a little carbonate of lead and carbonate of copper, and yielding a small amount of *selenium* and very small quantities of *arsenic*, *antimony*, and *phosphoric acid*.* I have found no molybdic acid nor tellurium in this kind of ore, the black central portions of which are, as Professor Silliman states, composed of *cerusite* blackened by *argentite*, but not argentite only, for the black substance yields lead, silver, and copper, so that it is evidently a mixture or compound of the sulphides of lead, silver, and copper; probably, if a single mineral species, a kind of *stromeyerite*. In other specimens from the same locality I have found most of the mineral species spoken of by Professor Silliman, and, besides these, a notable amount of *telluride* and *seleniuret of lead*, highly charged with copper and silver, in which ore, likewise, a very small amount of sulphur is present (but a considerable quantity of cerusite). Those specimens containing selenium and tellurium in notable quantity are much richer in silver than the others. Whatever may be the industrial prospects of the Utah district, there is no doubt that an abundant harvest is here opened for the mineralogist, and the thanks of the latter are due to Prof. Silliman and Dr. C. Jackson for having acted as pioneers in these interesting mineralogical regions. The other species which I have hitherto observed in these ores are silicate of zinc (calamine), carbonate of baryta, carbonate of lime, manganese oxide, also the red silicate of manganese, a little sulphide of bismuth, also a little native silver and gold, galena in specks here and there, malachite, jamesonite, and, doubtless, there are still others not yet well determined. The gangue is quartz, and the ores which I have examined yield abundance of lead and copper as well as silver.

T. L. PHIPSON, Ph.D., F.C.S.
Formerly of the University of Brussels.

Laboratory of Analytical Chemistry, Putney, London, S.W.

P.S.—In another letter I shall have a word to say on the origin of Cornish gossan, in reference to an interesting paper on the subject which appeared lately in the *Mining Journal;* the Utah ores referred to above furnish us with an example of the action of the atmosphere upon *sulphides*, we shall see in the case of gossans this same action upon *carbonates*, and on quite as grand a scale.

* I should, perhaps, state here that my specimens were not from the Emma.

SCIENTIFIC MINING IN ENGLAND.

SIR,—What a boon is a public business paper! Among its many advantages is that, it may be a minor one, of its being a source for an expression of appropriate feeling as regards the good or ill management of public companies.

In the Supplement to last week's Journal appeared a letter from the secretary of the Virtuous Lady Mine, which, I suppose, was intended to be of public interest. I could not help feeling that, as the affairs of this mine stand, how interesting an unvarnished tale from the secretary must be if adapted to the private interests of the shareholders; supposing we had been reminded that the quarterly meeting was at hand—that the mine had improved—that instead of debt there was a good balance at the bank—this might have tended to give the impression that the directorate had become alive to its duty, and that either it or its secretary was showing a practical business capacity. I am sure many of us suffering shareholders would be more interested in this than in their secretary's exhibition of intellect, or his display of, it may be, generous feeling, useful and right as it may be under some circumstances, for the benefit of the Prince of Wales, and, according to Mr. Secretary's judgment, lethargic mining men. I am not well acquainted with the management of public companies, so I may be wrong in thinking that a secretary is generally supposed to be the mouthpiece of the directors; but if I am right, what a marvellous increase in value, and so suddenly, too, as we know to our cost, has our mine had, for future investors can have 20 per cent. guaranteed. Surely, if our directors can prove that there is good ground for this offer, the shareholders may be inclined to think the right men are in the right place; but if it is in any way a delusion, we may again find our mine in debt and the miners unpaid. In reply to correspondents, I would say that I question my fitness to be a director; moreover, if it were otherwise, I should hesitate; for the little experience I have had would make me so cautious that I could not sanction a secretary's being so very self-acting, which crippling might lead him, with the large interest he holds in this mine, to take some step that would ruin it; also, this inexperience might cause me to be haunted with the idea that at some future time shareholders might try to show that directors are responsible for the consequences of the representations of their secretary.

G. TABOR.

SCIENTIFIC MINING—THE QUEEN MINE.

SIR,—Having seen a letter in the Supplement to last week's Journal concerning the extraction of silver from refuse or burrow stuff, I must beg to differ somewhat from Mr. Barnard in the matter of the salts of silver contained in gossans and flookans; it is only ores that are of sufficient density to concentrate by dressing processes that will profitably pay, as often we find in gossans and flookans a delicate argentic salt that is carried away by the water that is required in its dressing to concentrate it of sufficient richness to pay for extraction. Although we have profitably worked the Queen and King burrows, it must be borne in mind they were the refuse or debris from a regular silver vein, the only metallic ore found in combination being plumbic sulphide (or galena), which is easily disposed of. There is no doubt that there are mines producing ores throughout Devon and Cornwall that would pay handsome profits to the shareholders by the extraction of silver from the otherwise useless refuse. I can confidently say that from the experiments made during the past twelve months that if the stuff raised from the King and Queen Mines were worked on a large scale large profits would be realised from the extraction of silver alone, as all our lowest class ores have realised by extraction all of 50 per cent. profit, and this on refuse that was hitherto considered worthless. I quite agree with Mr. Barnard that the profits must be governed by the extent of works. As to our works at the King and Queen Mines, they are on a small scale, but if they were on a much larger scale, and suitable apparatus was provided for utilising the bi-products, which are otherwise going to waste, a very large revenue would be returned to the shareholders.

J. W. DOBLE.

CHONTALES GOLD AND SILVER MINES.

SIR,—I unfortunately do not receive your valuable Journal so regularly as I wish, but one of Nov. 18 has reached me, and I find in it a letter from "An Original Shareholder," to which, with your permission, I shall briefly reply. My estimates of the average yield of the mines have been exceeded by the returns. I estimated the value of the ore at from 5 to 7 dwts., and the actual yield during the past three years has been between 7 and 8 dwts. per ton. The reasons why more profits have not been made are that when I took charge the whole of the capital of the original company had been exhausted, without any adequate machinery having been erected; and that since then, until the reconstruction of the company, it was always in financial difficulties, so that I had only the means to erect 24 stamps, and to work a very small portion of the extensive properties. Of the capital of the new company none whatever has yet been placed at my disposal. Your correspondent is dissatisfied with the management. I can assure him that the disappointment is mutual. The only mistake I have made is that I should have imperilled my own credit by consenting to endeavour to extricate the company from its difficulties, without having insisted on sufficient capital being provided.

During the four years I have been struggling to place the company on a firmer basis, and to induce the shareholders to find the capital to develope their property, my conduct of the mines has met with the unqualified approval of the directors; and with respect to the officers under me, I believe that no company has been better served.

I shall not lengthen this letter, as my general report goes home by this mail, and it will explain fully the operations of the past year. I shall only say, in conclusion, that your correspondent, in taking advantage of my absence from England to state that I estimated the profits for 1869 at 11,200*l.*, and to withhold the fact that that estimate was contingent on the erection of 72 stamps, of which I have only had the means to put up 24, has not impressed me with a favourable opinion of his respect for candour and fair play.

THOMAS BELT.

Libertad, Nicaragua, Feb. 5.

THE BRAZILIAN GOLD MINING COMPANIES—CAPTAIN THOMAS TRELOAR.

SIR,—Will you allow me a short space in your valuable Journal to refer to the important question raised in last week's Journal by "A Shareholder in Brazilian Mines" (?)—a question which must be fully ventilated at the forthcoming general meeting. It is admitted on all hands that the most able and experienced practical authority of the present day on Brazilian mining is Capt. Thomas Treloar, although the reputation of that gentleman has been recently contemptuously ridiculed by scurrilous speculators, who shield themselves behind an anonymous signature, but a tree of 38 years' growth is not easily blown down.

I have known Capt. Treloar from his boyhood, and watched his steady progress. Capt. Treloar has been connected with Brazilian mines for 38 years—he first went there in 1834, and for 10 years was under the National Brazilian Mining Company. He went out as second mine captain, rose to be the first, and finally became the chief commissioner. In 1844 he had 12 months leave of absence and came to England, differed with the executive in settling his accounts, and, consequently, declined to return to Brazil in their service. Capt. Treloar next went out to Gongo Soco, under the Imperial Brazilian Company as chief mine agent, but here he remained only 17 months. An eminent geologist was the commissioner, but Capt. Treloar could not agree as to the working of the mine, and retired. Capt. Treloar then entered the services of the St. John del Rey Company, where he remained nearly 17 years, to whom is due the credit of the remunerative success of this great mine. He became connected with the St. John del Rey in 1845, and left in 1862, during which period the directors marked their approbation of his services by adding 300*l.* per annum to his salary, and by giving him presents of 500*l.* and 200*l.*, and six months' leave of absence without suspension of salary.

Upon leaving St. John del Rey Capt. Treloar came to England, and joined the Don Pedro Company as mine manager—this was in 1862; the company was then in difficulties, but Capt. Treloar recommended the purchase of the present Don Pedro Mine, thus securing for the company the proud position it has since occupied. Capt. Treloar's engagement for five years expired in 1868, when he again returned to England, and was instrumental in forming the General Brazilian Company. He purchased the mine, and accepted the position of manager for two years, and returned to this country towards the latter part of last year; since then he has received undeserved ingratitude from those who have profited by his name, fame, and services, and from which probably most of the Brazilian companies might have had the invaluable advantage of his services as a director or consulting engineer. I am told he so thoroughly disapproves the present system of mining that nothing would induce him to accept such a position. The success of the Don Pedro was the means of Capt. Treloar being drawn into other means much against his inclination, but upon this point I shall say more upon a future occasion.—*Helston, March* 12.

FAIR PLAY.

ST. JOHN DEL REY MINE.

SIR,—It is not my purpose to take any part in the discussion now going on in the Journal as to the market value of these shares—that I must leave to others who know more about this question than myself; but as Mr. Gordon's name has so often been paraded in connection with Morro Velho, with the object of disparaging Capt T. Treloar, in common justice to that gentleman—although I do not appear as his apologist, for he is perfectly able to fight his own battles—I think a few leading facts should just now be laid before the public.

Probably, nowhere is this parade more prominent, and, I may add transparent, if not impertinent, than in Burton's "Highlands of Brazil," unless it be in the scurrilous letter which appeared in the Journal a short time since, which was evidently written for a hidden purpose. I am told, however, the authors, much to their surprise, have been "unearthed," and are treated with merited contempt.

In Burton's work a table is given of the results obtained from Morro Velho, which represented by Burton's light is favourable to Mr. Gordon, but represented by the facts I shall throw upon it, a very different conclusion will be arrived at. Capt. Treloar became the chief mine agent at St. John del Rey in 1845, and the produce of his first year's working exceeded that of any previous one. Enemies said he "gutted" the mine; but this statement proved a fallacy, for he increased the returns from 128,513 ozs. of gold in 1845 to 543,637 ozs. in 1862, and had he not been interferred with, and thus driven to resign, doubtless the St. John del Rey Company would still be occupying a very enviable position.

When Mr Gordon was sent to Morro Velho, in 1858, he found the operations proceeding like clockwork; and such was the case when Capt. Treloar left in 1862. After the departure of the latter, Mr. Gordon became free to revel as he chose. The letter above referred to states that "a term of 17 years in Morro Velho is too long to sift through; but it was well known that the shares, under the indefatigable management of Mr. Gordon, rose from 30*l.* to 49*l.*" Is it not much more likely that to effect this advance in the price of the shares the mine was "gutted," and timber-work neglected, and that (owing to the latter) the mine must have collapsed, had not such an event been foretalled by a fire?

Here I may ask why a commissioner was not sent out from this country to minutely investigate the circumstances which caused the loss of so valuable a mine? At a future day I shall have something further to say to "Subscriber's" letter, and his reference to Don Pedro, Anglo-Brazilian, Rossa Grande, Sao Vicente, Taquaril, and General Brazilian Mines.

I think it the duty of investors to uphold *bona fide* mining, and crush if possible the present system, which can only be characterised by one name.

If Capt. Treloar, who, I am told, has resolved upon retiring from mining, could be induced to give the results of his experience, I think he could "a tale unfold."

March 12.

OBSERVER.

ST. JOHN DEL REY.

SIR,—I am neither an "Ecstatic Bull" nor an "Anxious Bear"—whatever those erratic animals may symbolise—but I am a practical engineer, and I know that the cost and time required to dig a hole of a given depth, to a fixed spot, through strata of known character, can be calculated with tolerable accuracy. I want to know, therefore, why your correspondent, "Another Shareholder," thinks that the new shafts have been sunk in the wrong position, and that the remaining 104 *fms.* will take so much longer to sink than the rest have done? I should like to know the grounds upon which he bases his opinion, because I have watched with some interest the progress of these shafts with a view at the proper time to make an investment in the mine, thinking it promised a larger and more certain return for my outlay, within a moderate period, than any other similar enterprise with which I am acquainted, and if I contemplate a foolishness I should wish to be warned in time.

I have been informed that no larger supply of water is met with in the new shafts than formerly had to be dealt with in the old workings, except of course what has accumulated in the latter since they were abandoned, and which now finds its way into the shafts. The time required to pump out this accumulation can be calculated almost to a week, and as the sinking of the shafts does not increase in difficulty at greater depths, but rather the reverse, I am at a loss to account for the lugubrious anticipations of your correspondent except upon the theory that the wish is father to the thought. That the water finds its way so readily from the old workings into the new shafts is to my mind a proof almost conclusive that they have been sunk precisely in their proper place. It does, however, occur to me that as this influx of water from the old workings was inevitable, the directors might have provided adequate pumping-power a little earlier. In all other respects they seem to have acted with energy and foresight.

London, March 7.

ENGINEER.

ST. JOHN DEL REY.

SIR,—As you have admitted into your columns various letters tending to depreciate the value of this property, from writers who profess to be shareholders, I, who am also a shareholder, but neither "bull" nor "bear," may fairly ask for a little space to protect the interests of myself and other *bona fide* members, who desire to see the market value of the shares approximate a little nearer to what we gave for them. Your correspondent seems to regard his shares as dead, and to be "waking" them after the Irish fashion—by howling. Now, Mr. Editor, permit me to ask your correspondent a plain question or two. Why does he talk about what he confesses his ignorance of? Why does he, at the same time, ask for information and pretend to impart it to us? Why, if he is ignorant as he says he is, does he not do as others of us do, go to the only proper sources of knowledge—the reports? certainly they have not been suppressed the last two months, for I have them now before me, both from the office and in both daily and weekly newspapers.

If your correspondent would but refer to to the reports, he would put his tats-

ments on the fire, instead of publishing them, to the attempted injury of his neighbour. But if he thinks to discredit these reports, and the board of direction, and the superintendent at the mines, let him modestly and once for all that we, the shareholders, have far too much confidence in them to lend this unknown man, this man in the mask, our ear. Referring to the position of the shafts, I ask your correspondent to give us the name of one—only one will suffice—practical man of reputation who holds the opinion that they are sunk in the wrong place; until he does that—bah! let him tell his tale "to the marines." And with regard to future sinking (when pumping out the water is an accomplished, as it is now a progressing, work), it does not need the wisdom of Solomon to see that the softer rock which we have come upon means less time, less labour, and less cost, than the exceedingly hard rock we have passed through. And here I may say, that notwithstanding this hard rock, we have sunk, up to Oct. 31 last, in each shaft 126 fms. out of 178 fms., in three years, at a total cost for sinking of 25,000*l*. Your correspondent can verify this statement if he will take the trouble to walk to the company's office. Permit me, Mr. Editor, in conclusion, to say to him that, so far as I am concerned, and I hope my fellow-shareholders will take a similar course, "in vain the net is laid in the sight of any bird."

Dalston, March 7. SATISFIED.

FOREIGN MINING SPECULATIONS.

SIR,—By last week's Journal, I find that a statement was made at the Emma meeting, by Mr. Park, that the New York market was not large enough to float a mining stock to the extent of $5,000,000, and that there had never been one to that extent. Was not T. W. Park interested in floating the Mariposa Company of California, in New York, and has not its history reached England?

One more correction. The chairman of the Eberhardt Company stated that the information he had concerning Col. Bulkley treated him as an agent visiting the district at the instigation of the United States Government. Mr. Bulkley is a surveyor, not in any way connected with the Government, but has been in White Pine every day for the past two years, engaged in his profession.

March 13. WESTERN.

"WHAT TO SELECT—WHAT TO AVOID"—No. XIV.

SIR,—One of the crying evils of the present day is what has been not inaptly termed "Circular Mining." I am not going to say that anyone engaged in the purchase and sale of mining shares is not justly and legitimately entitled to issue a periodical circular containing such information as he may think necessary to make known to those with whom he transacts business, but I do protest most emphatically, and all interested in the extension and promotion of legitimate mining should join me in the protest, against the scattering of circulars broadcast, purporting to emanate from different firms (?), whereas, in reality, each so-called firm is a part and parcel of the other.

There are many fictitious firms, each of which issue a circular. The system adopted is for each firm to forward to the same individual a copy of a circular, the idea being that the incautious, seeing that a mis called mine is recommended by so many supposed different parties, he will naturally think that such a uniformity of testimony is in favour of the property being all that is represented, and that, therefore, failure is not likely to be the result. But how different is the fact,—each is but a member of the same firm. I could point out an entire list in which it would be difficult in one single instance to find the representative even of the name that is painted on the respective door-posts, to say nothing of the non-existence of the firm itself. The system is most pernicious and subversive of true legitimate mining, and no less contrary to the proper uses of a trade circular. It is a system, indeed, which has no other purpose than to inveigle into unsound schemes the inexperienced and unwary, who cannot conceive it possible that such a base system can exist in the City of London.

I am continually receiving letters from different parts of the country complaining of what they call the circular nuisance, to the whole of whom I quickly make known the facts above stated. This illegitimate trading under false names is a commercial iniquity, which should be stamped out; that which is recommended from such sources is utterly valueless, while such prices are extorted for the shares that in nine cases out of ten an interest can be acquired at a much less price in a really proved mine, respectably conducted on a sound financial condition, and commanding a negociable value, which can be realised at any time.

The public cannot be too cautious how they are induced to lock up their capital in such schemes, which are formed with but one object—the aggrandisement of the vendors, regardless altogether of the future.

FREDK. WM. MANSELL.

1, *Pinner's-court, Old Broad-street, E.C., March* 11.

TERRAS TIN—PRIVATE CIRCULARS.

SIR,—Mr. John Addison's "Scotch logic" apparently consists of reckless assertions and perverted truth. He published garbled extracts from Mr. Charles Thomas's report, in order it would seem to mislead the public, and in reply to that gentleman's remonstrance he asks "Why should I refer to what Terras was a year ago?" Mr. Addison then brings a serious charge against our firm—that we are only trying "to serve a selfish purpose—to try and frighten timid adventurers to suit the dealers." Can Mr. Addison deny that when we sold him shares in March, 1871, we recommended him not to increase his interest, and yet at that time we were getting a good turn by selling promoters' shares at little more than half the price at which they they were so strongly recommended in private circulars? He further accuses us of having offered him 500*l*. for the loan of 500 shares till June; but why pervert facts? On Dec. 12 Mr. Addison wrote to us about our strictures upon Terras, which he thought "must be replied to," and he continued "I hear 2s. per share will be paid in January, which will be a fair start. I have no cash to go in for shares at present, as I am engaged in the potato trade, and poor at present. There are some shares, I think, worth buying, but unless my acceptance was taken for six months I could not go in for them. By then I should likely be able to pay for them or sell, and give you a good commission by aiding me; it would only be for the value of 100*l*., or about. As buying into any mine is attended with risk, if you think of this write me, or could you raise me a loan on 583 Terras shares?" On Dec. 13 he again wrote, "You need to have a poor opinion of Terras, but it is to be a great tin mine, or many of the most knowing men will be cheated. I would not object to sell some 83 shares out of 583, if a fair price can be got, but I would rather have a loan on them for six or even twelve months, but six months would do me, or five; it is only till the potato season is over. See what you can do, as money is cheap in London, and likely to be for a time. If you can do this I will make it pay you." On Dec. 16 he wrote, "I really wish you could raise 700*l*. on 583 Terras shares and my own responsibility. Money is cheap about London, and if you could get it I will give 5 per cent. for six or twelve months, and give you 10*l*. for your trouble. I expect there will be some reply to your letter in the Journal, but I am quite at sea about the matter; but you are more in the way of knowing about it."

From the foregoing correspondence it will be seen that instead of us applying to Mr. Addison for the loan of his shares he was most desirous of hypothecating them. In reply we informed him that no dealer would lend money upon Terras shares, being too well acquainted with the merits of such a prize. We advised him to reduce his interest, but stated "As you may think our opinion is biassed, you had better apply to some respectable stockbroker experienced in mining, and have the mine inspected by an independent agent before operating." It is evident that Mr. Addison has put all his eggs into one basket, and his faith in the mine has, perhaps, induced him to adventure more than he can afford to lose; but will abuse of us, and all who may entertain a different opinion of Terras, cause the mine to sell more ore, or the shares to be saleable? Mr. Addison, and many others north of the Tweed, express the greatest faith in Terras, but it is the very essence of faith to be uncritical. "To the faithful any contradiction of faith assumes the character, not of fair divergence in judgment, but of heresy. Simple non-acceptance of the creed may provoke a pitying smile at the sceptic's invincible ignorance, but to question it must be malice, envy, and imbecility." We hope Morningside is a pleasant retreat, as it is not likely to want for occupants in the future; but if Mr. Charles Thomas has to depend upon Terras dividends, legitimately earned, "for a fat goose and a good turkey" for his Christmas dinner we shall decidedly decline any invitation for that festive occasion. Your readers will have perceived that we had good grounds for complaint against the management of this company. Up to the present time, and from the formation of the company, the shareholders have not received a proper statement of its financial position—a fact in itself totally inexcusable. We pointed out the glaring discrepancy in the two agreements, both bearing the same date; the one which was filed only bound the contractor to erect 100 heads of stamps, but the other which was published to the world bound him to erect 200 heads. In the report of the meeting held at Grampound-road, on Jan. 31, at which five shareholders were present, it is stated, "The directors beg to lay before the meeting a document containing a definition and specification of the works which the contractor is bound to execute under his original contract, and which the directors and contractor have mutually agreed to and ratified. The directors have the utmost confidence in assuring the shareholders that the agreement will be highly beneficial to the company." Now, we ask, why was not a copy of this document forwarded to each shareholder, or at least published in the papers, so that the adventurers might be able to form their own opinion of the beneficial nature of this new agreement? The directors also appear to have arrogated a power which they do not legally possess—viz., to cancel former agreements, and substitute others, without the consent of the shareholders at a general meeting. This company has been floated, and the shares put to fictitious prices by means of the "private circular system." At the present time there are a dozen firms who recommend the same properties—Terras Tin, Franco Consols, East Llangynog, and Aberdaunant. Parties who knew more of souchong and bohea than tin or copper strongly advocate the merits of these four mines, to the exclusion of all others, in circulars headed "New Series, No. ——." In fact, to those who are acquainted with the antecedents of the authors, it would appear that the only qualification necessary for a "financial adviser" is to have failed in any other kind of business. Parties have been, like Mr. John Addison, induced to buy largely in Terras, and now they want to realise—it will soon be devil take the hindmost.

If our statements respecting this company have been palpably incorrect, why do not the management, or any of its defenders, refute them in a business-like manner, instead of twaddling about the skill and energy of its officials, the honour and probity of the contractor and directors, the prospects of the mine, and the unceasing source of regret it will be to all who do not secure the shares at double the price at which they can be obtained in the open market? We beg to thank "A Cornish Miner" for his letter respecting this property, which only confirms the advices we had previously received.

Bishopsgate-street Within, London. W. MARLBOROUGH AND CO.

MINING IN ABERYSTWITH.

SIR,—An unusual amount of activity seems to prevail at present in the mining districts of this locality, and indeed it is surprising to learn the good that is being made manifest by such operations. There seems to be no lack of employment, and everyone appears to be interested in the lead mines. A few days ago I went with a friend to look at old spots once familiar in my youthful days as being places where the ancients got a little lead from: now these places are teeming with life, and every one seems to be happy and busy. The Bronfloyd, Cwm Sebon, Cwm Symlog, Cwm Erfin, and many other mines, and some with new names, become Anglicised by the great influx of Englishmen and capital. There is great talk about the Bwich Gwyn and Penrhew Mines, now called the Aberystwith Mines, becoming great stars: I have examined some fine specimens of galena (nothing can surpass them), having been broken yesterday from the 30-fm. level, west of engine-shaft; the local agents and those connected with its history augur well for its success. It is quite certain that it will not fail being successful for want of energy with the practical or financial portion of it, and really if mines in the same district that were at work contemporaneously with these and have been resumed, and the results satisfactory—indeed, some highly so—surely there can be no longer a reason to call such chance, but an investment. Since I find there is not a poor or unproductive mine at 50 or 60 fms. deep in the locality, I fancy, therefore, that the Aberystwith people, as well as those connected with the locality, are beginning to feel the great advantages arising out of the mineral wealth of the district, and may they long prosper.

Aberystwith, March 8. A FRIEND TO ITS INTEREST.

NEW WHEAL LOVELL.

SIR,—I am a shareholder in New Wheal Lovell, and find by the account a balance against the mine of only 59*l*. 4s. on the four months' working, and upon the cost-book 113*l*. 2s. 11d. There is a defalcation of 662*l*. by the late purser, Mr. Bawden, which is now attempted to be charged, and a call of 4s. per share made to pay it off. This, in my opinion, is unfair; and if Mr. Bawden is unable to pay it I think the directors ought to be made accountable, as they should have not only seen that they had a proper and responsible man, but that the money was only paid in the proper way and in the due discharge of the debts of the mine. I hope some of the shareholders will not allow this matter to drop.

Aughnacloy, March 6. AN IRISH SHAREHOLDER.

"NEW VAN MINING COMPANY."

SIR,—I observe in the Journal of Saturday last (March 9) a short prospectus of a company under the above heading. In order to prevent litigation, I take this opportunity of advising yourself and readers that a company under the above-mentioned title has been in existence and working by a private company for the last four years, and is still in existence. The "New Van" mining property adjoins the Aberdaunant on the west, and the Gweston mining sett on the east, and the Van lode runs through the property. In the interests of the "New Van" proprietors I have ventured to send you the above notice.

Gracechurch-street, London, March 11. J. P. ENDEAN.

"CIRCULAR MINING."

SIR,—Will you allow me to call the attention of your country readers to a gross imposition now being carried on by certain obscure London sharedealers. I have received no less than four circulars from gentry of this class, strongly recommending mines, shares in which no prudent and responsible broker would ever advise a customer to buy.

I strongly advise ladies and all parties who are inexperienced in mining, and in the best way of buying into mines, to pay no attention whatever to any circulars sent by parties of whom they know nothing. Shares offered by private circular at 3*l*. and upwards are often unmarketable at any price on the Stock Exchange. The plan followed by these men is to procure lists of shareholders in mines and other industrial investments. Having procured the names and addresses of the investors, they send out their circulars by the thousand, strongly advising some particular mine or mines in which they are entrusted, but which no prudent broker would ever advise a client to buy into. These gentry generally manage to clear at least 1*l*. per share, they also get their 10 per cent. from the office, and the regular commission from the country customer.

Altringham, Cheshire, March 12. T. SPENCER JACKSON.

[For remainder of Original Correspondence see to-day's Journal.]

USEFUL HINTS TO INVESTORS.—The second edition, improved by many important additions, of the pamphlet—"What to Select—What to Avoid," by Mr. F. W. MANSELL, has just been issued, and contains a large amount of information which cannot fail to be of considerable value to all who seek to make advantageous investments in mining undertakings. The chapter on "Mining as an Investment—its advantages, profits, and prospects," is well calculated to give confidence to capitalists with regard to the stability of mining enterprise, without leading them to the erroneous supposition that because the prospects of a mine are good an immediate fortune can be anticipated, and that the obstacles to be overcome are fewer than those attending commercial enterprise generally. In the chapter on "Mining Prospects, and the Necessity of Ample Working Capital," Mr. Mansell remarks that during an experience extending over a period of twenty-seven years he never recollects home mining—legitimate mining—to have been in such a generally healthy condition as it is now, arising from the improving value of metals, consequent upon the demand created by the universal expansion of trade; and these observations will readily be confirmed by all who have the opportunity of forming an opinion on the subject. As an Englishman, Mr. Mansell naturally gives the preference to the development of our home mines, but he is careful not to underrate the merits of those in other countries, remarking, with great truthfulness, that "as to foreign mines, they should not be denounced as valueless, or something worse, simply because they do not happen to be situated in our own country, although there appears no sufficient reason for an English capitalist or investor, desirous of investing in mines, to select foreign enterprise while there are so many at home of more certain value;" and he observes, with equal truth, that intending shareholders should satisfy themselves that ample working capital is provided, not only sufficient to meet ordinary requirements, but also what are known as "unforeseen contingencies," which, however, unforeseen, invariably arise. The remaining chapters on the necessity of caution in the selection of mines, advantages of mining as an investment in times of panic, resultant evils of inadequate working capital, the cost-book and limited liability principles contrasted, &c., are all equally interesting, and most will agree with his conclusion that the pursuit of mining is not so completely a lottery as many think; it needs only the application of the same sound principle which is every day brought to bear upon all branches of our commercial industry to ensure much more satisfactory results than can possibly accrue from any other source of investment.

MINING MAGAZINE AND REVIEW.—The March number of this magazine contains an ably written article on the Mines Regulation Bill, by the Editor, and four other original articles—on the Iron Ores of Cornwall, by J. H. Collins, F.G.S.; on the Law Relating to Mines, by J. Shortt, LL.B.; on the Progress of Mineralogy, by F. W. Rudler, F.G.S.; and on the Lead and Zinc Mines of the Mendips, by Horace B. Woodward, F.G.S. The Current Topics, Reviews, and Notes on Notable Things give evidence that no pains have been spared to maintain the character of the work.

CHEMICALS AND MINERALS.—(Messrs. J. Berger Spence and Co., Manchester, March 13).—The demand for chemicals continues unabated, and makers are forced to advance their prices for almost all articles, the small surplus supplies they have being eagerly picked up. The high figures now ruling do not appear to have any appreciative effect upon the continental demand, current prices being readily paid, and the orders from the United States this spring are considerably above the average. Last advices report large sales of soda ash and miscellaneous chemicals at advancing rates. Doubtless the forthcoming Presidential election has partly to do with this increased demand. The exports for the past month to all parts are favourable, and a suggestive fact is furnished from them, showing the increase in values. The quantity of alkalies exported in the month of February, 1870, is within a fraction of that of the corresponding month of 1872, the values being for 1870, 94,242*l*., and for 1872, 129,691*l*. Other chemical products also give a considerable increase. Caustic soda is scarcely obtainable, and soda ash is in a similar position; in both cases prices have advanced. Bleaching powder is selling readily at current quotations, and there is difficulty in obtaining deliveries. Soda crystals are 5s. per ton higher. Nitrate of soda has again fallen in price, and there is little chance of any improvement taking place for some time time. Muriate of potash remains steady. Bichrome unaltered. Prussiates are scarcely so firm, but chlorate has advanced. Sulphate of ammonia has been in better enquiry for early delivery, and 22*l*. 10s. may be considered the present price; for forward 23*l*. is asked, and seeing the production will now diminish rapidly there is every chance of a further advance when the export demand begins. Sulphate of copper and oxalic acid remain unaltered. For green copperas the demand is good, and benzole is in increased enquiry. The mineral market has exhibited very few changes since our last report. Supplies of copper, tin, lead, and zinc ores are admitted to be short, but, on the other hand, greater exertions are being made to augment their production. The fine weather has stimulated the demand for phosphatic minerals. Pyrites and manganese ores are in good demand. Plumbago and chromates of iron are without alteration; for the former, however, the price is rather firmer.

IMPROVED FURNACES FOR REDUCING OXIDES.—The furnace invented by Mr. JAMES ANDERSON, of Newbuildings, Ireland, is somewhat like an ordinary blast-furnace but the top is covered in and fitted with various valved inlets or doors for the introduction of the materials. There is a central inlet for coal or carbonaceous matter, and a set of inlets round it for the ores or oxides, the silicates, aluminates, or other salts, and the lime or flux. It is preferred to draw the gases out of the furnace by exhausting apparatus. Only a comparatively small portion of the coal is to be introduced by the central inlet at the top, the larger portion being put into chambers or channels formed at the sides of the lower part of the furnace. One or more horizontal, or nearly horizontal, passages are formed in connection with the hearth at a suitable height for the slag to flow off by, leaving the iron in the bottom of the hearth to be withdrawn by a separate outlet; and the air supply enters by what may be termed the slag passage or passages, and in doing so takes up heat from and so cools the slag. The air thus entering and becoming heated in the slag tunnels and passages finds its way into a gallery formed round the lower part of the furnace, whence it enters the interior, first passing through the coal or coke in the bottoms of the lateral coal chambers, and thereby having its oxygen converted into carbonic oxide. The coal in the chambers becomes gradually coked through the action of portions of the hot gases resulting from the combustion in the lower part, and passing up through it, and the gases and vapours evolved from it are led by suitable passages into the interior of the furnace to assist in reducing and heating the ores. At and above the part of the furnace where the reducing action terminates air is admitted to complete the combustion.

Royal School of Mines, Jermyn Street.

[FROM NOTES BY OUR OWN REPORTER.]

LECTURE XXVI.—In yesterday's lecture (continued Mr. SMYTH), I placed before you some of the points affecting the modern system of working out horizontal galleries or levels. I dwelt on the necessity of selecting the proper ground, and especially where the width of a lode rendered it impossible to take the whole in the level, and so it became necessary to drive on one part of it, and then explore the other parts from time to time by means of cross-cuts. The question in such cases will be, at what distance from each other should these cross-cuts be made? But although that will naturally vary according to the nature of the lode, yet under no circumstances should the distance be more than 20 or 30 fathoms, otherwise a risk will be run of ore ground being overlooked. In the great majority of metalliferous mines I may point out that amongst the ordinary levels some will pass entirely within the productive mineral, others will be in the dead ground or country, for the purpose of following up the lode and exploring, while another class of levels and cross-cuts will be made for the sole purpose of exploration, and are then called "querschläge" in German. There is a great difference between these different classes of levels, for while exploratory levels are carried as straight as possible, those for getting the mineral cannot be so managed. A plan of an interesting group of lodes at the celebrated mine of Botallack (exhibited on the wall) shows that they run north and south, but the levels are very far from the straight line, deflecting and deviating with the lodes, which, although they have the same direction, run irregularly. Occasionally these deviations are of a sudden kind, and of an extravagant character; but, notwithstanding, it is of the utmost importance to keep the gradients at a regular rate throughout. Where the levels are intended to be mere lines of thoroughfare, it is necessary that they should be as straight as possible. In dealing with coal beds there is no reason whatever why they should not be straight, because the colliery is started to get a certain quantity per diem, and one of the best means of doing that with ease and regularity is to have good roadways. In metalliferous mines, on the contrary, they are not able to do this to any great extent. True, they may occasionally go straight instead of circuitously, but as in reality the work is all exploratory, to see where the metal is in the lode, regularity like that of a colliery is out of the question. In cases where they come upon a mass of ore it may be necessary to amend the levels, by widening and cutting away projecting angles; but all such operations are expensive, and therefore it is wise and economical to make the course of the levels as regular and direct as possible. I have already mentioned that uncertainty sometimes arises as to where the lode is, because, however different it may be to the walls or country, the men sometimes find themselves at a loss to know where their lode is. The manager may go down some day, and the men will tell him that they cannot see the lode, and the question is whether to drive to the right or to the left in search of it. In some districts the constant attention of the manager must be directed to the task of seeing that the men are on the lode, and carrying out their work in the best way. Suppose they are driving on a large and distinct lode, and then come to a place where it disappears, or becomes quite barren; the men are very apt to leave the line they ought to follow, particularly if there should happen to be a little softer ground to the right hand or to the left, and it will probably be found that they have in this way swerved in some degree from the line they were following before. The level must in such cases be restored to the right line. In another case the lode may become poor, and by-and-bye the men come to an end where there is no promise whatever; and then if it is found that the lode has made a turn the level must follow it and turn also. Various other incidents of a similar kind may occur—as, for instance, the men may have followed strings which are not in the lode, and which die away in the country; then it will be necessary to hark back, for the purpose of recovering the main lode. I am speaking of lodes of moderate width; but suppose we are dealing with a large lode, like the great Comstock lode, Nevada, or of Foxdale, in the Isle of Man, circumstances such as those described have happened with regard to the orey parts, and then comes the question which part should be driven on. I have said enough on the subject of the ordinary drifts and roadways of a mine to show the necessity of regular workings.

A few more words may be said as to the levels intended to unwater groups of mines. In some cases this arrangement has been indispensable for the development of the mining wealth of a district. If we look at many of the groups of metallic mines in Europe we shall find that although great attention has been bestowed upon the equalisation of water in most districts, there are some in which levels of this kind are on a most gigantic scale. In our own country I may point out two notable examples. One is the great County Adit, in Cornwall, driven in the course of the last century, and the ground relieved from water by it is from 30 to 40 miles in length, if we include the channel driven out to Gwennap from Redruth; its depth from the surface is from 20 to 30 fathoms; and although so shallow, a very large body of water flows out from it, and runs down into Falmouth Harbour. Another case is that undertaken by a single individual, Mr. Beaumont, for the purpose of unwatering his mines in Cumberland, which it will effect to a depth of 72 fathoms. The length of that level is to be 6567 yards, and it is effected by driving from the lower end. This great work has had to be driven through a hard variety of mountain limestone, which is no easy task. Besides relieving the ground from water, adits offer some advantages for making exploratory cross cuts. On the Continent more remarkable still is the great "George Adit," at Clausthal, in the Hartz, which reaches a depth of 148 fathoms, and unwaters the mines to that enormous depth. This adit is called after our King George, and was remarkable for the rapidity and skill with which it was driven. It was commenced in 1799. A number of shafts were sunk and levels driven right and left from the bottom of each till they met, so that at 30 different spots the work was pushed on by independent sets of men. Within the last few years a still deeper adit has been completed in the Clausthal district, which is called, after the late king, the "Ernest Adit." It is 18 miles long, and was remarkable for the good dialling and the rapidity with which the work was carried out; it is 9 ft. in height and 6 ft. wide, and was attacked at 10 different points, the work being pushed on so vigorously that it was completed in 13 years. In another remarkable case in the Hartz a great distance was accomplished in a very short time by sinking in like manner shafts on the line, and then working right and left towards each other, so that several different sets of men could be employed at once. This adit was driven 18 miles in length, and it laid dry the country to a depth of no less than 200 fathoms. They are now engaged upon a still deeper adit, the water from which will have to be pumped up to the shallower one, which has a natural outfall. Another of these famous works is that called the "Francis Adit," at Schemnitz, in Hungary, so called after the Emperor Francis, where the shafts could not be put down so near to each other as those at Clausthal, but being carried under high mountains the distance between the shafts was 1¾ mile; this, of course, greatly enhanced this difficulty of the work. The Francis Adit, however, was admirably carried out by driving parallel drifts between the Josiper shaft and the Sigisbergshaft, a distance, as I have said, of 1¾ mile. The "Oscar Level" for draining the Persberg district, at Phillipsberg, in Sweden, is also a remarkable work. The opening is 8 ft. high and 9 ft. wide, driven through greenstone of the hardest quality, like the American propylite. They employed the boring machine of Mr. Bergstrom, which operates by the extreme rapidity of blows given by a borer worked by means of compressed air.

After reviewing all these admirable works carried out in Europe during a period extending over many years, it is curious to turn to what has been projected in America, and see the great difficulties which beset the construction of a deep adit to unwater the great Comstock lode. They have a mountainous range of country to deal with; numerous shafts have been put down all over it, so that the nature of the rock is well known, and the produce of the lode is of marvellous richness. Under these circumstances it is surprising that some arrangement has not been made long ago for the purpose of unwatering this extraordinarily valuable lode. And when we find that at no great distance there is a deep valley, so that if a level were driven up from it a depth of 2000 ft. from the surface would be unwatered, it is to be regretted that some such work has not been carried out, and so saved the enormous loss which has been sustained by the erection of draining and pumping machinery at so many separate points, and by so many different sets of miners. Indeed the Luttrel adit was proposed by a miner named Luttrel, in 1869, which if carried out would have been most useful, but it is now hindered by doubts which have been started whether the lode is not giving out in length. It is difficult to see what the result will be, but the way in which the expenses of working have been unnecessarily multiplied is fortunately without parallel in Europe.

We will pass now from the subject of levels taken generally to consider the means by which they are kept open—in other words, the securing of the workings. Some of the levels driven in metalliferous mines are left unused, or comparatively unused, for a great length of time, and others are driven for merely temporary purposes; and while in coal mines you may say at once which are to be permanent roadways and which are to be only temporary, it is more difficult in metalliferous mines to determine which are to be abandoned, and which are to serve the purposes of permanent thoroughfares. In the latter, therefore, as most of the drifts are only exploratory, the cheapest means of securing them is employed, and this is done principally by timbering, or "wooding," as it is called in the North of England. This, although the cheapest in the first instance, is a great source of expense where the ground is of a softish character, and a constant subject of anxiety. In many mines the mere cost of opening out the ground may be from 12*l*. to 20*l*. per fathom, in consequence of the hardness of the rock, while in others when the ground is soft it may cost only 2*l*. or 3*l*. per fathom, but the hard rock will require little or no timber, whereas in soft ground and large lodes, in flookan lodes and lead mines, it is necessary to introduce a great deal of timber at once, and where the natural circumstances of a mine fosters the natural tendency to decay it will be necessary to replace that timber very frequently indeed. Timber when put into a drift to keep up the roof, or to hold the walls in their places, must be placed in the proper direction as to pressure. It must be remembered that the pressure is not always perpendicular, and its true direction must, therefore, be carefully observed. When the pressure is vertical it will be met by upright pillars, or what are called "props." Then we may have timbers resting on two fixed points, with the weights between them, tending to rupture the timber in the middle. In a third case, as, for instance, in pump-rods, there is a tendency to pull, as it were, the wood asunder. It is desirable, therefore, wherever it is possible, to choose the sort of wood most suitable for resisting the power it has to meet. From the timber obtainable on or near the spot there may not be any considerable amount of choice, but when the mines are near the sea there is no reason why the best timber should not be obtained. In other cases we must put up with the best we can get. Of the kinds of timber generally used fir is the most valuable. It is cheap, light, and straight, and some kinds are very durable. The most common sort is larch, which is especially useful in places which are alternately wet and dry. A second useful kind of fir is what is called spruce, a Norwegian fir, and by the German miners "fichte." Then comes the Scotch fir, grown so largely in Norway, which is so much used in our Cornish mines, and which ought to be called Baltic timber. It is the *pinus sylvestris*, but it is especially to be noted that the varieties of it grown elsewhere than in Norway and Sweden do not possess the same qualities. Oak is excellent, but it is too expensive to work, and dear in cost besides. When it is plentiful, however, the smaller branches may be obtained at a moderate cost, and are much used in mines, last-

ing a long time. Beech, birch, and Spanish chestnut are in vogue in some continental districts, and sweet chestnut is largely employed in the States of America. In the South of Europe and in Brazil the acacia is much in request. For certain purposes some large scantlings have to be employed, and some fine examples of that class have been imported into Cornwall from the Pacific coasts of America. I have seen pieces at some of the Cornish mines 90 ft. in length, and 12 or 14 in. square at the small end. Magnificent pines are also brought from Vancouver's Island.

The necessity of a careful attention to "propping" seems to be anything but general amongst miners. In metalliferous mines, the men, although they see cracks, and the mass above is evidently breaking away, often go on long beyond the point of safety, although they need only put in a single prop or strut. This is a very simple operation. Whether a strut or a single prop it needs only to be well placed, and then to be firmly wedged against the rock, when it is often found to sustain a great mass, until the men are ready to let it down or blow it down, as the case may be. In the case of collieries a good deal of work is done under the protection of a row of vertical props, on the top of each of which, to enable them to get a good hold of the ground, a cross-piece is placed, which is called a tymp, or lid. Behind these props there is invariably a back row, which, as the face of working is advanced, are brought forward and made the first row. The men who are employed in holing the seam put in props, which are called struts, or sprags; but in consequence of the want of due attention to putting these in when necessary a great number of men lose their lives, the deaths annually resulting from falls of roof of coal or rock being more than the whole of those which result from explosions in our collieries. Instead of wooden props cast-iron ones have been tried, but, on the whole, without advantage, being found unwieldy and awkward. Good reports have been made of them in some places, but I cannot say that at present they have been found superior to wooden props. Of course, they are intended to be removed and used over again and again; but in diffienlt positions they are as likely to be lost or left as the wooden props.

Another mode of the application of wood is its use in securing the drifts and levels against the roof breaking in. What is done depends materially upon the nature of the ground. Sometimes it is enough to cut hitches or niches in the wall, and put in cross-pieces of timber; but when the material overhead is loose and broken, these cross pieces or, stemples, as the Germans call them, or stull pieces, as in Derbyshire, Cornwall, and other western districts, must be put in much closer to each other. A hitch or notch is cut for one end, and the other end is brought down upon an edge piece and driven home with a few forcible blows; then the transverse pieces are laid over, so as to receive the weight of the material above. This is the simplest way of placing the timber; but, simple as it is, the ordinary men are scarcely capable of dealing with it thoroughly. There are plenty of men both in Germany and in Cornwall who seem to see by instinct where and how to put in the timber; but it is very curious that in other districts there should be such a great backwardness in this respect, and that they should so often put in timber in such a way as not to sustain any considerable weight; and so the captain has to come in and have it placed in a better way.

SHAFT SINKING THROUGH WATER-BEARING STRATA.

Mr. EMERSON BAINBRIDGE, Assoc. Inst. C.E., read a paper at the Institution of Civil Engineers "On the Kind-Chaudron System of Sinking Shafts through Water-Bearing Strata, without the use of Pumping Machinery." Of the total expenditure necessary to open out a coal field, one of the chief items of cost was caused by the heavy expenses incurred in sinking the shafts, and when such sinking happened to pass through water-bearing strata the proportion due to this head of the total cost was much increased. When a shaft exceeded 200 or 300 yards in depth, and when the water occurred near the surface, it was usual to keep the water back by the insertion of cylindrical metal "tubbing," placed upon a hard bed of rock at a point immediately below the lowest feeder. Where pits were less than 100 or 200 yards in depth the application of tubbing was not of much service, as the movement and dislocation of the strata, consequent upon the removal of the coal, generally caused the water to find its way into the underground workings. The sinkings in which there was the largest quantity of water had been carried in Belgium through the chalk, and in England through the Permian series; these rocks usually being sufficiently porous to contain large volumes of water. Without exception, in England all such sinkings had been made by the use of pumping machinery of sufficient power to keep the pit, during the process of sinking, comparatively dry.

It was stated that the question of dealing with wet sinkings in the most economical manner would, before long, become of much greater importance than heretofore. In the report of the Royal Coal Commission an estimate was given of the coal remaining in the British Islands, as follows:—

Coal yet remaining, which is or will have to be reached by sinkings through the coal measures .....Million tons	90,527
Coal yet remaining, which is or will have to be got by sinkings through the Permian and other formations overlying the coal measures.....	104,418
Total	194,945

It thus appeared that 104,418 millions of tons, or 54 per cent., of the remaining resources of the British coal fields would have to be reached by pits sunk through the Permian and other formations more recent than the coal measures; and, as a rule, more likely to be saturated with large volumes of water. With such important evidence bearing on the future of coal mining, it had been considered that the present was an opportune moment to bring under the notice of the Institution a description of a mode of sinking shafts through water-bearings rocks which had proved successful in many cases on the Continent.

The plan of sinking pits hitherto practised in this country consisted in dealing with the water by means of large pumping engines, in leaving the bottoms of the pits dry enough to allow the sinkers to block the well, and in keeping back the water in the upper strata by metal rings, cast in segments about 4 feet long, and connected by wooden joints, which were wedged tight, when all the tubbing was fixed. The evils of this system were:—1. The heavy first cost of the plant, when special pumping machinery was used.—2. The expense of the wedging tubs, and the cost of fixing them.—3. The delay caused by the sinkers being compelled to work always in water.—4. The high first cost of the tubbing and of fixing it in the shaft, and the liability of the tubbing leaking in consequence of the numerous joints.

In the application of the Kind-Chaudron system these evils were to a great extent avoided. This system consisted of a combination of Mr. Kind's well-known apparatus for boring wells, with an ingenious device, invented by M. Chaudron, for fixing cylindrical tubbing under water in such a manner as to make it quite secure and water-tight. In the latter part of 1871 the author, accompanied by Mr. W. Cochrane, visited the Maurage Pits, near Mons, where two shafts were being sunk by this process. These shafts, though having a depth respectively of 373 and 593 feet at the date of that visit, had been bored that depth under water with a diameter of 13 feet 6 in., the water having been constantly standing at a depth of 37 feet from the surface. The Chaudron system consisted of the following distinct processes:—1. The erection of the machinery on the surface.—2. The boring of the pits to the lowest part of the water-bearing strata.—3. The placing of the tubbing.—4. The introduction of cement behind the tubbing to complete its solidity.—5. The extraction of the water from the pits, and the erection of wedged cribs to secure the moss-box. The machinery on the surface consisted of a capstan engine, which raised the debris from the pits, and a vertical engine, by means of which the boring tools were lifted at each stroke; the speed of the latter engine varying from 15 to 18 strokes per minute. The first tool applied was the small trepan, which weighed 8 tons, and bored a hole 4 ft. 8½ in. in diameter, the depth of the boring being increased at the rate of from 6 to 10 feet per day. The pit was enlarged by a trepan weighing 16½ tons, which increased the size to 13 feet 6 in., and was kept from 10 to 30 yards behind the pit made by the smaller trepan. The larger boring tool had 28 teeth and the smaller tool 14 teeth, each tooth weighing 72 lbs. The boring by the larger trepan did not progress faster than about 3 feet per day of 24 hours. The boring was generally carried on in the day, the remaining 12 hours being employed in raising the debris from the pits. When the bottom of the water-bearing strata was reached the tubbing, which consisted of metal cylinders cast in complete rings of an internal diameter of 12 feet and a length of 4 feet 9 in., was placed in the shaft, the rings of tubbing being connected by bolts. The tubbing was tested by hydraulic apparatus to one-half more pressure than it was expected to be subjected to. The rings of tubbing were let down into the shafts by means of the capstan; the moss-box at the bottom of the tubbing being placed in the pit first. The moss-box consisted of two cylinders, one sliding inside the other, and each having a flange broad enough to form a chamber to hold a quantity of ordinary moss. When the moss-box reached the bed which was prepared for it at the bottom of the pit, the weight of the superincumbent tubbing pressed upon the moss, and formed a water-tight barrier. The tubbing being thus fixed, the annular space between it and the sides of the shaft was filled with cement, thus ensuring the solidity of the tubbing; after this was finished, the standing water in the shaft was drawn out, and the joint below the moss-box was made permanently safe, by the fixing of several rings of tubbing resting on two strong wedging cribs. The comparative cost of sinking by the processes referred to was shown by two tables, one of which exhibited the complete cost of sinking, and the time occupied by the ordinary system, at 18 different collieries, whilst the other gave the same information for 10 collieries put down by M. Chaudron's process. The results showed that, whilst with the system of sinking by the aid of pumping machinery the average cost per foot had amounted to 114*l.* 7*s.*, and the rate of sinking to 8·9 feet per month, with the Chaudron process the average cost of all the pits was equal to 22*l.* 9*s.* per foot, and the speed of sinking to 15·8 feet per month. This striking result, which was so much in favour of the Chaudron system, evinced the importance which this mode of dealing with water-bearing strata was likely to have. It was remarked that, where a large quantity of water occurred in shallow sinkings tubbing would be of no avail, and the economy of boring by the "Niveau plein" system would probably be considerable. On the other hand, where the strata were hard, and where the feeders of water were so well separated by beds of rock as to allow them to be dealt with separately, the ordinary system of sinking might prove as economical as the Chaudron process. The boring of the shaft by the Chaudron process could not be said to be advisable below the water-bearing strata, as with an increased depth the time which could be utilised in boring would become less, and further, the small particle into which the rock was broken by the tool hindered the sinking, so that it progressed more slowly than when the shafts were sunk by the ordinary mode.

THE HOBBS HILL MINING COMPANY.

This mine has been specially inspected, on behalf of the company, by Capt. Tim Rowse, of Great Treveddoe Mine, and by Capt. W. C. Vivian, of South Condurrow and other mines. It must be very gratifying to the shareholders to learn that these independent and practical gentlemen confirm the opinion and recommendations of their own agent, Capt. Temby, who has for a long time urged on the company the necessity of making a tramway, and putting the stamps and dressing-floors into proper working order.

A call of 3*s.* 4*d.* per share (100*l.*) has been made by the directors, and there is very little probability of a further call being required. When the recommendations of the agents are put into effect, which will be done with as little delay as possible, according to the calculations set forth by the inspectors, founded upon the regular monthly sales of tin, the shares in this company, it is considered, will pay 16 per cent., or 2*l.* per share.

At a meeting of shareholders, held at the offices of the company, New Broad-street, on March 5, the directors said they had had the mine inspected by Capt. Wm. C. Vivian and Capt Tim Rowse. "Capt. Vivian, is well known in the western part of Cornwall as a man of considerable experience and superior ability. Capt. Rowse is, perhaps, the best authority on the kind of mine with which we have to deal. Capt. Rowse is the manager of Old Treveddoe, or Wheal Whisper as it is now called, one of the oldest tin mines now at work in Cornwall, which is (and has been for scores of years) worked as an open cutting or quarry, similar to our own operations at Hobbs Hill. The produce of Treveddoe stuff is stated to be equal to 2½ lbs. of tin to the ton. The Wheal Whisper is being worked, we are informed, at a profit of some 30 or 40 per cent.; hence we have every reason to be confident of success, provided the recommendations we have received are acted upon with vigour. Capt. Rowse has offered to render us his assistance and advice in arranging the most economical mode of working. Both of these agents, you will observe, nearly agree as to the amount of profit to be derived upon a small outlay, which cannot but be gratifying to the shareholders. Great credit is due to Capt. Temby for having worked the mine for so long a time at such a comparatively small loss, considering that he has not had the support of the shareholders to carry out what is now recommended by our inspectors, which he long ago advised. Although the directors have every confidence in Capt. Temby, it has been considered desirable to appoint a local purser in the person of Mr. James Cock, of Liskeard, a gentlemen who has been recommended to us by our bankers. It is the intention of the directors to make an offer to the Hammett Mine Company, for the purchase of their machinery (which we are now renting) previous to making any outlay."

The following are the inspectors' reports:—

Reskadinnick, Feb. 29.—In inspecting Hobbs Hill mining ground I first directed my attention to the stamping-floors. The lower water-wheel, which is the one now being used for stamping your tinstone, is 30 feet high, and 4 feet in breast, with 36 heads of stamps attached, of which 32 are working; there are five round buddles, cleaning-house, &c. In order to catch as much tin as possible, and make the most of your tinstone, two additional round buddles are wanted with a set of dead frames for taking out the slime tin, which is now allowed to flow into the river, and is thus lost. Long drags should be also substituted for the present short ones with cross strips to take the stamped tinstuff to the buddles with the least possible labour, as it must be by an economical system of working in every department that profits are to be derived from tinstone of the low produce which you are at present quarrying. These improvements may be carried out for about 100*l.* The tinstone quarried from the elvan course should be sent down in a slide to the spalling-floors, a little up from the side of the river, and from thence be taken to the stamping-mill on a short railroad, or an incline over the river, to be worked by the upper wheel. The cost of this arrangement would be covered by 100*l.* The improvements indicated would effect a saving in the working cost of about 30*l.* per month on the present scale of operations, whilst yielding about 10*l.* worth of tin more per month than can be extracted with the present dressing appliances. Until these improvements are made it cannot be proved whether or not a profit can be derived from stamping the elvan tinstone. It would appear from the present returns, and costs made under great disadvantages, that the elvan course may be worked profitably by adopting the most economical system which is possible. Should this prove so the next step will be to put the upper stamps (consisting of 30-ft. wheel, 4 ft. breast, with axles, 24 heads, of which 12 are in working order) in an efficient state, and commence stamping with full power, which is equal to 48 heads. By doing this the returns of tin will be proportionally increased, without increasing the cost in the same proportion, thus leaving a wider margin for profits.

There will be no difficulty in obtaining ample supplies of tinstone from the quarry near the floors of the quality which has been hitherto wrought, and which yields about 5 lbs. of black tin per ton of stone, so that the additional stamping power can be supplied. The two mills brought up to their full efficiency will be equal to 84 heads, and by working up to this extent you will, I think, bring your sales of tin up to about 4½ tons per month, worth at the present price (say) 360*l.* Judging from the present rate of cost these returns may be calculated to leave about 160*l.* per month profit. The proposed improvements, including the putting of the upper stamps in good order of working, would cost about 50*l.*, and may be completed in two months.

After the present works have been put into an efficient state, I would strongly advise the driving of the adit level from the valley westward, towards Tinner's Lane shaft, where, judging from the large excavation made by the ancient miners, and from the quantity of tin which the present company obtained by a few months working in the same site, there seems a good chance of your laying open a large and productive tin lode, from which good profits may be made. There is a distance of about 80 fms. to drive the adit from the present end to Tinner's Lane shaft, but as it will be on the course of the lode, profitable tin ground may be met with in any part of this distance. I find from Capt. Temby that there is another lode, about 60 fms. further north, on which an adit has been commenced further up the valley, and driven about 20 fms. westward into the hill. This lode is about 2½ ft. wide, and the tinstone which has been broken from it is, in my opinion, of the best character of any that I have yet seen from this district. I think this to be worthy of a further trial, and would advise that the adit commenced on it should be continued further as soon as possible. The first adit referred to will acquire a depth of about 40 fms. as it goes westward into the hill, and the second one that of about 20 fms.—WM. C. VIVIAN.

Wheal Whisper, Warleggan, near Bodmin, Feb. 23.—In compliance with your orders I inspected the Hobbs Hill Mine on the 20th inst., I find your operations confined to the elvan course, which is about 30 ft. wide, producing tin throughout of good quality. This being the fourth time I have inspected and reported on this mine, I am very pleased to say I never saw it looking so well as at present. The elvan produces very good branches of tin, and also tin dispersed throughout the stone, which I think will average full five pounds of black tin to the ton of stuff, more than equal to many mines in the district which are paying high percentage profits. The position of the mine affords every facility for cheap working; the elvan running into a fast rising hill, and being of immense size, is worked as an open quarry, and the supplies almost inexhaustible, I should, therefore, advise that the mine be worked on a larger scale; you have plenty of water-power within easy distance of the tin stopes, a tramway could be put down at a very small outlay, which would render the cost of transit of the ore comparatively nothing, in fact not over 1*d.* per ton, this, compared with the present arrangement—horse and cart labour—would lessen the monthly expense 30 per cent. You have every advantage for stamping four times the quantity of stuff that you are now stamping, and the mine calculated to produce that amount of stuff at once; 80 tons per day at 5 lbs. of tin to the ton would produce 4 tons 12 cwts. 3 qrs. 12 lbs. of black tin per month, making allowances for repairs of stamps and other contingencies, say 4 tons net; this, with spirit and economy could be done at 30 per cent. profit on your gross returns with tin at present price. In order to accomplish this an outlay is required. I consider few mines are more worthy the necessary outlay than Hobbs Hill. The stamps require some repairs, and also the dressing-floors. I think your present tin dresser competent of making the alterations required, and by doing this I think every shareholder will be well pleased.—TIM ROWSE.

In reply to enquiries, Capt. Rowse writes, Feb. 27:—"Yours of the 26th to hand. Nothing has been done since my last report at Tinner's Lane, consequently my last report stands good. I think that was to drive an adit from the south part of your sett and to bring a tramway from the north of the adit around the side of the hill to your present stamps; but seeing your elvan is so improved and somewhat caunting your east and west lodes, I should advise you to confine your operations to the elvan, which must be worked at a profit, and extending this would be by far the best way to develope the mine. The cost of tramway proposed would not far exceed 100*l.* To repair the present stamps and put the upper stamps in good working order, with as many more heads as the wheel could drive, 400*l.* The dressing-floors could be put right at a small cost, say 60*l.* As your tin is good and strong, very much work could be done self-acting; your winding machine now taking up stuff would then supply the higher run of stamps. I know of no adit going west except that on the north or Royal lode; this would be too far north to be of any good to the place I last named at Tinner's Lane south workings. Your elvan is proving to open beyond expectation, and if it continues as at present it must make a profit: this is beyond all possible doubt.—TIM ROWSE.

NEW PEMBROKE MINE.—At a general meeting of adventurers, held at the mine on March 5 (the Rev. E. J. Treffry, D.C.L., in the chair), the accounts for September, October, November, and December showed a credit balance of 1162*l.* 10*s.* 4*d.* A dividend of 960*l.* (3*s.* per share) was declared, and 202*l.* 10*s.* 4*d.* carried to credit of next account. Capt. F. and J. Puckey say—"During the past four months we have sold about 51 tons of black tin, which has realised 4323*l.*, and copper to the value of 812*l.*, together equal to 5135*l.*; and from the length of productive tin ground driven through at the 90 or bottom level, the future prospects of the mine still continue good for tin, but of copper our returns will in a great measure depend on the discoveries we can make. The mine is in good working order, and all our operations are being forced on as rapidly as possible."

EAST POOL MINE.—At a meeting of adventurers, held at the mine on Monday, the accounts for Dec. and Jan. showed a profit of 807*l.* 16*s.* 10*d.* A dividend of 800*l.* (2*s.* 8*d.* per share) was declared, and 28*l.* 16*s.* 1*d.* carried to credit of next account. In addition to the perplexities and interruptions alluded to by the agents, and accounting for the short returns at this account, the committee add that they have not felt justified in declaring a higher dividend than 2*s.* 6*d.* per share; but they anticipate an increase at the meeting in May if the weather, which now appears more favourable, should continue to improve. The committee, having in view the practice now adopted in the neighbouring mines, feel constrained in the interest of the adventurers at large to dispense in future with the account dinners, which have become very inconvenient, arising from the increased and increasing number of shareholders and the limited extent of accommodation. Capts. W. S. Garby (manager), J. Maynard, and J. Hosking say—"Since our last meeting we have put in three strong brick dams in Wheal Agar, at a cost of 220*l.*, whilst the extra consumption of coals alone has amounted to nearly 600*l.*; a large increase in the price of every other mining material has also contributed to swell the amount for the two months. In consequence of the great influx of water we have been prevented from working in the two bottom levels for nearly four weeks, and these being our best producing points for tin it has materially interfered with our returns. But we have now nearly completed another dam at the 50 fm. level in Wheal Agar, from which the water is coming, which we hope will enable us not only to keep the water from rising, but to get out what is now in the mine within a month from this time."

NORTH LEVANT MINE.—At a meeting of adventurers, held at the mine on March 9, the accounts showed a credit balance of 1729*l.* 4*s.* 11*d.*, a dividend of 1600*l.* (16*s.* per share) was declared, and 129*l.* 4*s.* 11*d.* carried to credit of next account. Capts. J. Bennetts and H. Eddy say—"Several hundreds of pounds have been spent during the past six months in clearing old workings and improving the plant, from which our returns have been small, but which are for the benefit of the future working of the mine. Our sales of tin for the past six months have been quite equal to our expectations, and we calculate our returns for the ensuing six months will be about the same quantity, and we are glad to say our prospects continue good."

[For remainder of Meetings see to-day's Journal.]

FOREIGN MINING AND METALLURGY.

The scarcity of pig-iron is becoming every day greater in Belgium, and prices exhibit a proportionate advance. A quotation of 4*l.* per ton for refining pig, reported recently, has become general, and everything leads to the belief that it will soon be exceeded. The fact must be recognised, for the rest, that a check is not very probable, and that when pig is advancing all metallurgical articles follow the same movement, more or less. Advices from Charleroi state that merchants' iron, No. 1, remains firm, at 8*l.* per ton; but No. 2 plates have risen to 10*l.* 16*s.* per ton, representing an improvement of 8*s.* per ton, which will not stop there. One house has placed No. 4 at 8*l.* 8*s.* per ton. The demand is very great for iron, and it could not well be otherwise, as, independently of the exceptional state of affairs due to the events of 1870 and 1871, there has been a rapid extension of all the industries employing iron. All countries appear to be voting credits for improving or extending their networks. Thus, the Belgian Senate has just voted unanimously (less one vote) a credit of 640,000*l.*, applied for with this object by the Minister of Public Works. The Martin-Siemens process has been introduced at the Sclessin establishments in connection with the manufacture of steel.

The coal market continues very active in the various Belgian basins. Stocks are scarcely increasing, and deliveries both by railway and by water are effected with more regularity than hitherto, so that the execution of orders is rendered easier. Orders for domestic qualities of coal are small, but qualities used by industrials are in very good demand. Coalowners show reluctance to enter into contracts to be executed at comparatively remote periods. Prices display little variation; freights are nearly stationary, but show a slightly upward tendency. The colliery of Jamioulx, to the south of Charleroi, has just been brought again into activity.

The condition of the French coal trade appears to be improving, thanks to the increasing facilities afforded in respect of means of transport. In consequence of the improved traffic arrangements now existing, consumers appear to have ceased their complaints as to the want of combustible. A good deal of attention is being devoted at present in France to the question of the navigation of canals and rivers accommodating industrial centres, and important works are anticipated which will render the passage of coal, &c., boats on navigations less onerous. The number of working coal miners in the coal basin of St. Etienne is returned at 16,416. The number of pits at Rive-de-Gier from which coal is extracted is 29; the number of exhausted pits, 7; and the number of new pits now being sunk, 1. In the sub-arrondissement of St. Etienne coal is being extracted from 62 pits, 17 pits are now exhausted, and 30 pits are now being sunk. The working miners of Hayange, in the Moselle, who had struck to the number of 800, have followed the example of their Belgian comrades, and have resumed work on the old terms.

Paris, which hitherto had remained somewhat behind the general upward movement in prices, appears at last disposed to follow the current. Plates have attained a quotation of 12*l.* 8*s.*, and merchants' iron one of 8*l.* 16*s.* to 9*l.* per ton. These prices are still lower than those current at other centres, and it is expected that a further advance will take place shortly in all the principal articles. The last advices from St. Dizier give the price of merchants' iron, coke-made, at 8*l.* 16*s.* to 9*l.* per ton, in warehouse at the works, and these rates are considered very low. There is a great abundance of orders, and a further advance in prices is looked for. The production, the same time, follows a progressive movement. New rolling-mills which MM. Dumont and Son, are constructing, near Maubeuge, are on the point of being completed. They will be equipped with tools, it is stated, in order to produce about 1500 tons of plates monthly. The puddling apparatus is installed, and was to commence working on Friday (March 15). It is expected that the rolling apparatus will be ready for working April 1. The Northern of France Railway Company has concluded a contract with the Terrenoire Works, for Bessemer steel rails, at 11*l.* 10*s.* per ton.; similar rails could not, it is stated, be obtained in Belgium at less than 15*l.* per ton and in Germany at less than 16*l.* per ton. About 17,000 tons of rails ordered by the Western of France Railway Company have been obtained at 8*l.* 8*s.* 6*d.* per ton—terms which are again lower than corresponding quotations in Belgium; with such prices France might prove a formidable competitor with England and Belgium in the matter of iron, were not her production so restricted. Iron tyres for trucks have been ordered at 19*l.* 4*s.* per ton, at St. Etienne, and puddled steel tyres at 24*l.* to 25*l.* 4*s.* per ton, at the Allevard Forges. Upon the whole, there appears to be room for a further advance in French prices.

At Havre, Chilian copper in bars has made 87*l.* to 88*l.*; refined ditto, in ingots, 80*l.* to 84*l.*; Peruvian minerals, pure standard, 71*l.* to 72*l.*; United States, Baltimore, 76*l.* to 78*l.*; Lake Superior ditto, 92*l.* to 94*l.*; Mexican and Plata, in bars, 66*l.* to 68*l.*; old yellow copper, 40*l.* to 44*l.*; red ditto, 62*l.* to 66*l.* per ton. At Rotterdam, Drontheim has made 50 fls. to 52 fls.; and Russian crown, 51 fls. Tin has been in more favour during the last few days. At Marseilles, Banca has made 154*l.*; English, 152*l.*; and French 156*l.* per ton. At Amsterdam and Rotterdam, Banca has made 85 fls., and Billiton, 84½ fls. There has not been much change in lead. At Paris, French has made 19*l.* 8*s.*; and Spanish, 19*l.* 8*l.* per ton. At Amsterdam, soft lead is quoted at 11 fls. to 11½ fls. At Paris, Silesian zinc delivered at Havre has made 23*l.* 16*s.*; other good marks delivered at Havre 23*l.* 16*s.*; and ditto delivered at Paris 23*l.* 16*s.* per ton. At Amsterdam, Silesian zinc has realised 13 fls. to 13½ fls.

Soundings made near the coal basins of the Saar and the Ruhr, and at Eschweiler, have indicated the presence of new beds of coal. Near Essen especially it is found that the coal basin of the Ruhr extends far beyond its present limits. As has frequently happened before after the piercing of argilo-ferruginous rock, a discovery was made of a bed of coal more than 40 in. in thickness. The quality of the coal is about equal to that of the best gas coal. This discovery is a surprising one, and is expected to have important consequences for the industry of the north-east of the province. Encouraged by this success, the parties who have been making the soundings propose to make others near the Lippe, in Westphalia. The capital required for these operations (50,000 thalers) is proposed to be raised by an issue of shares. Another fact indicated by the soundings which have been made is that the smaller basin of the district—that of Eschweiler—extends as far as the environs of Aix-

la-Chapelle, passing near Weiden. The coal is also of superior quality. The very considerable industry of the town and its neighbourhood is expected to be much increased by the deliveries which have been made.

Advices from Vienna state that prices have greatly advanced in Austria, and notwithstanding the dearness of English rails they still contrive to compete with Austrian. At Berlin, Silesian coke-made pig is quoted at 57 to 58 silber groschen per quintal; charcoal-made pig is worth 63 to 64 silber groschen per quintal at the works. Good English marks are worth 60 to 61 silber groschen per quintal. At a recent adjudication for locomotives for the Upper Silesian Railway Herr Wohlert tendered at 19,300 thalers per engine for (three-wheeled coupled) locomotives and tenders; and the Konigsberg Union at 17,173 th. per engine for (two-wheel coupled) locomotives.

THE QUICKSILVER TRADE.

The following shows the quicksilver produced in 1869-70-71:—

	1869.	1870.	1871.
New Almaden Mine .....Flasks	17,000	14,703	18,762
New Idria Mine	10,450	10,000	9,227
Redington Mine	50,000	4,546	2,128
Sundry other mines	1,150	1,000	1,763
Total .....Flasks	33,600	29,546	31,881

The exports to the different countries for 1871 and the three previous years were as follows:—

	1868.	1869.	1870.	1871.
New York .....Flasks	4,500	1,500	1,000	800
Great Britain	350	—	—	—
China	17,785	11,660	4,050	7,900
Mexico	14,150	8,050	7,088	3,081
South America	2,500	2,900	1,300	2,500
Australia	1,180	300	300	1,100
British Columbia	20	4	9	6
Other countries	501	51	41	118
Total ..... Flasks	41,506	24,415	12,788	15,205

And our exports previously have been:—

In 1867 .....Flasks	28,853	In 1859 .....Flasks	3,399
„ 1866	30,287	„ 1858	24,142
„ 1865	42,469	„ 1857	27,262
„ 1864	36,927	„ 1856	23,740
„ 1863	26,014	„ 1855	17,165
„ 1862	34,747	„ 1854	20,968
„ 1861	35,995	„ 1853	12,737
„ 1860	9,448	„ 1852	900

The Redington Company has produced nothing since Oct. 31, and the Phœnix Mine has produced, during 1871, 763 flasks from a partial working. The entire product of all the mines on this coast for the year 1871 aggregates 31,881 flasks, against 29,546 flasks the year previous. High prices under the monopoly rule have been kept up for three years past. The three-years contract purchase expires on April 1, when a complete change in the programme may be looked for. Already shipments from London and New York are *en route* to this coast, and lower prices may be looked for at any moment. Present nominal prices, 82½ c. and 85 c.—*San Francisco Market Review.*

MINING ON THE PACIFIC SLOPE.—From a carefully-prepared statement of mining dividends paid during 1870 and 1871, published in the *Daily Evening Bulletin* of San Francisco, it appears that the profits of mining in 1871 were considerably more than double those of 1870. The figures were—

	1870.	1871.
Amador, California	$ 175,400	$ 24,050
Argenta	21,000	—
Chollar-Potosi	658,000	1,652,000
Crown Point	—	480,000
Kurcka, California	480,000	240,000
Kurcka Consolidated	—	275,000
Golden Chariot, Idaho	75,000	170,000
Golden Rule	3,000	—
Grenville, California	—	4,000
Gould and Curry	48,000	—
Hale and Norcross	504,000	160,000
Ida Elmore	20,000	—
Kentuck	30,000	—
Keystone	—	26,000
Meadow Valley	150,000	47,000
Metropolitan Mill	10,000	—
North Star, California	16,000	60,000
Original Hidden Treasure	32,000	—
Pioche	—	20,000
Raymond and Ely	—	615,000
Redington Quicksilver	—	31,500
Sierra Nevada	37,500	20,000
Succour Mill	—	11,400
Union	30,000	—
Yellow Jacket	—	444,000
Yule Gravel	—	35,000
Wheeler	6,000	—
Total	$2,224,400	$4,837,950

THE COMSTOCK LODE.—The out-turn of some of the principal mines on this lode has been enormous. Twelve of them, up to the middle of August last, had produced, been assessed, and made dividends as follows:—

	Bullion produced.	Dividends.	Assessments.	Price of mines.
Ophir	$ 5,240,000·00	$1,394,400	$1,232,000	$ 420,000
Gould & Curry.	13,555,232·24	3,876,800	633,600	494,000
Savage	14,427,456·48	4,288,100	468,000	592,000
H. & Norcross.	4,485,475·12	1,598,900	690,000	800,000
Chollar	10,780,021·10	2,800,000	462,000	933,100
Imperial	5,074,581·95	1,077,500	490,000	200,000
Empire	2,629,339·94	511,600	90,000	36,000
Yellow Jacket..	14,177,774·30	2,181,000	1,538,000	1,08[illegible]·00
Kentuck	4,070,097·81	1,252,000	70,000	228,000
Crown Point ..	4,334,112·00	978,000	623,700	3,600,000
Belcher..	1,570,37[illegible]·00	—	231,400	2,4[illegible],000
Overman	1,692,347·00	—	724,283	76,800
Totals	$84,016,811·89	$19,900,300	$7,235,083	$10,857,900

MINING ON THE PACIFIC COAST.—The "Commercial Herald and Market Review," in its Mining Review for 1871, speaking of the prospective yield for the incoming year, says—"There can be no question but everything wears a most cheering aspect, and that the product will prove to be unusually large. When we take into consideration the entire situation—the immense gains we have now made in the business of mining, the improved processes and machinery lately introduced, coupled with the great number of new reduction works erected, and the certainty of ample water supplies for the approaching season, we find here an aggregate of recently accruing advantages that warrant us in predicting for the current year a yield of the precious metals equivalent to eighty-five or ninety millions of dollars; and, should nothing transpire meantime to mar the present prospect, there would be little ground for surprise should the product reach a hundred millions by the end of the year. Everywhere new ore-crushing mills have been erected, the most of them of large capacity, and nearly all capable of doing better work than the average of those before put up. Improved furnaces have been built for roasting the rebellious ores, and a great number of smelting-works constructed in the base metal districts. In the ditches and reservoirs built in this State the past year our water-supplying facilities have been increased fully 20 per cent., while capital, the most powerful auxiliary of all, has come to our assistance, with a freedom and readiness never before experienced—such aid having, in fact, never before been so fully deserved. With all these helps, and the many new discoveries being made, and rich mines constantly developed, we feel confident that, with no untoward turn of events, there will be gathered from the mineral regions west of the Rocky Mountains a hundred million dollars within the next twelve months."

ON ENGLISH INVESTMENTS ON THIS COAST.—The "Review" says—"But whatever the mistakes made at White Pine, and however the investments of British capitalists may finally result in that district, they have undoubtedly fared better, and, in fact, almost invariably done well, in their recent investments elsewhere on this coast. Look where we will, and we find that they have become in almost every important district partial owners in, or the sole proprietors of, some of the best mines there. Reese River country, in the Eureka, Pinto, Mineral Hill, Troy, and several other promising districts in Central Nevada, at a number of points in Utah, in southern Idaho, and throughout the mineral regions of California, they have become proprietors, partial or exclusive, of many of the most valuable mines yet found in those localities; these parties having generally confined their purchases to well proven and actively productive properties. Going to the extreme southern portion of the metalliferous range in this State, and passing to its terminus, 300 miles north, we find Englishmen owning and operating mines in every county throughout this entire distance. In Inyo they own the Eclipse—probably the best mine, and including mill, water privilege, tramway, and other improvements, by far the best developed, well conducted, and valuable property, in that section of the country. Already 40 stamps are in operation there, with 50 more soon to be added—the whole driven by water, of which the company have an ample and unfailing supply. Their mine, consisting of a large vein of gold-bearing argentiferous galena, is well opened, there being already sufficient reserves established to keep their mills and furnaces running an entire year. In Mariposa county the Ferguson Mine, lately sold to English parties, is opening auspiciously, indicating that they obtained it at a figure greatly within its real value. In Tuolumne, Calaveras, Amador, El Dorado, and Placer we find further fortunate purchases made on London account, and embracing both gravel and quartz mining properties. In Nevada county several such sales have been effected, with negociations for others, promising to result in still greater advantage to purchasers still pending. In buying the Bird-eye and Sweetland Creek, hydraulic gravel mines, our English brethren have done well, as will soon be demonstrated, now that the embargo so long placed on their productive capacities by the drought has been removed. The same will prove true, and perhaps in a more eminent degree, of the North America group of gravel mines, also recently transferred to English parties. And so we might proceed, including in our list the Sierra Buttes and many other mines, until we had swelled it to much greater proportions; the instances already enumerated being sufficient to indicate the general character of the properties heretofore passed over to the proprietorship of foreign investors. In this connection, it may be pertinent to supplement the able replies of Ross Browne and others to the enquiry "Why our mine owners, having such good properties, are so willing to part with them?" by the further remark that, under our liberal laws, regulating the location and holding of mines, a single individual may, and in fact frequently does, become the owner of a great many properties of this kind; or make any of them practically available. Hence his desire to part with a portion of his interests, that he may realise some ready cash, and be enabled, if he desire, to improve the remainder. Nearly every miner, though a labouring man, is the owner of a claim of some kind; and if he sells it, knows just where he can go and take up another—a knowledge that the capitalist does not always possess, nor if he did could he readily turn it to practical account. The other reasons that might be assigned, in answer to the above enquiry have already been so well stated that they need not be repeated.

EMMA ORE.—There are about 1200 tons of this ore piled up at Sandy Station, the present terminus of the Utah Southern. Some 90 tons of this ore were taken out of the mine daily during last week, but the company is thinking of dropping down to about half that amount. The ore which is now coming out of the mine is of a higher grade than was ever taken out before; three lots, of 100 tons each, gave an average assay of $275 to the ton.—*Scientific Press* (San Francisco).

UTAH BRANCH OF THE MINING BUREAU OF THE PACIFIC COAST.—GOVERNOR GEO. L. WOODS, OF UTAH, ONE OF THE MANAGERS.—We are gratified to learn that the exertions of Col. Berton, Vice-Consul of France, and President of the Mining Bureau, have resulted in the solid organisation of a branch office of that institution in Salt Lake City. The name of the present Governor of Utah as one of the managers is a sufficient guarantee that the good already accomplished by the Bureau has been appreciated, and that ample protection will be afforded to foreign capitalists desirous of investing in legitimate Utah mining enterprise. The press of Salt Lake City have unanimously welcomed the organisation of the branch. The following is from the *Salt Lake Daily Herald*:—"We are informed that the board of directors of the Mining Bureau of the Pacific Coast, on receipt of a telegram from Col. Berton respecting the proceedings of the late meeting of our leading miners, met at San Francisco and decided that, owing to the magnitude of the Utah mining interests, a branch office of the Mining Bureau be opened at Salt Lake city and managed by E. P. Hutchins, Esq., secretary of the Bureau, in conjunction with two leading citizens of this city. Col. Berton, Vice-Consul of France, and President of the Bureau, and Col. Harry Linden, member of the board of directors, now in this city, having been instructed to establish the branch office of the Bureau, have accordingly appointed Geo. L. Woods, Governor of Utah, to act as manager, in conjunction with E. P. Hutchins, secretary of the branch office. Governor Woods is well satisfied with the objects and standing of the Bureau, and has accepted the appointment. The third manager is Col. J. S. Nevett."

STAR OF NEVADA SILVER MINING COMPANY.—This is an English company, recently organised for the purpose of working a series of ledges lying in Union Hill, Austin, Nevada. The present workings are prosecuted through the old tunnel, started some years ago by the former owners. It now penetrates the hill a distance of 410 ft. It is being driven ahead by contract, and will be continued till all the ledges of the company have been cut. This tunnel has already cut three ledges, each of which will in time be fully developed. A level 300 ft. long has been run from the tunnel east on the first ledge, exposing a body of good ore, averaging 6 in. in width the entire distance; in fact, some of the mineral is really beautiful, and must work at a high rate. The last crushing of ore from this ledge, worked sometime in October last, produced nearly $1500 per ton for the first-class, and over $300 per ton for the second class. Three sections of this level, on the north side, have been leased to as many parties of good miners. All are sinking on the ledge, which still holds good, and there is every prospect of their doing well for the company and themselves. The company are themselves opening and working this level on the south side. Messrs. Garrison and Co. have lately secured a lease on the second ledge cut by the main tunnel, and have started work on a level to develope it. The company has also just given a lease to Messrs. George Emerson and Co., who are now hard at work sinking a shaft from the surface of the hill some distance from the line of the tunnel. About 300 ft. from the mouth of the tunnel the company are erecting hoisting works for the purpose of sinking a 300-ft. shaft, through which the greater part of the workings will hereafter be carried on. In the ore-house are about 15 tons of a good quality of ore, which must soon increase to large quantities, unless the present appearances of the mine are wonderfully deceptive. The success of this enterprise cannot reasonably be doubted, as the mine looks well, the location is good, the workings are carried on systematically, and the management of the whole conducted with an apparent principle of economical thoroughness.—*Reese River Reveille*, Jan. 27.

FOREIGN MINES.

DON PEDRO NORTH DEL REY.—We are informed that at the general meeting of the company, to be held on the 28th inst., the directors will propose the payment of a dividend of 2s. per share.

DON PEDRO NORTH DEL REY.—Copy of telegram from Lisbon:—Remittance, 20,017 oitavas; produce for January, 10,179 oitavas; first division of Februgry, 4220 oitavas.

BIRDSEYE CREEK.—The directors have received a telegram from their superintendent, J. A. Stone, giving the following result of a clean-up:—Necce and West, 27 days' run, profit $1250; Uncle Sam, 34 days' run, profit $3000; Brown's Hill, 28 days' run, profit $1500: total, $5750, of which he has remitted $1000.—[The directors have declared a first bi-monthly interim dividend of 2s. per share.]

GOLD RUN.—The directors have received the following telegram from their agent:—"Net returns of mine for 24 days' run amount to $4000, which I remit."

MINERAL HILL.—The directors have received advices of further remittances coming forward in the present month sufficient for the payment of the debenture interest due on April 1, but have received at the close of the last week unsatisfactory accounts as to the continued productiveness of the mines. Mr. John Taylor, jun., immediately proceeded to Nevada to investigate the cause, and report fully to the board on the state and prospects of the mines.

SIERRA BUTTES (Gold).—The result of the clean-up for February is as follows: Receipts, $34,018; 3176 tons of ore were crushed during the month. Cost of mining and milling same at $3·90 per ton=$12,386·40.

JAVALI.—The directors are in receipt of advices from the manager, dated Feb. 6: 95 tons of ore had been crushed during the month, yielding 460 ozs. of gold, an average of ½ oz. per ton. Expences, 636l.; profit on the month's work, 500l.; everything going on well.

CHONTALES.—Mr. Belt, Feb. 6: Cost for the month of January, $6239 68 c., which includes $1003 58 c. expended on capital account. Return of gold for the month 304 ozs., from 1341 tons of ore; average yield, 4¼ dwts. per ton; value of the gold, $4265 80 c.

San Antonio Mine: A stope in back of the level east of the eastern cross-cut has been stoped 36½ varas; the lode is 3 ft. wide, worth 3 dwts. of gold per ton. A stope in the back of the connection level has been stoped 37 varas; lode 3 ft. wide, worth 6 dwts. of gold per ton. A stope in the back of No. 6 level has been stoped on the south part of the lode 18 varas; lode 2 ft. wide, worth 4 dwts. of gold per ton.—East San Benito Mine: No. 2 level has been driven on the lode 23 varas, for the first 6 varas worth 4 dwts. of gold per ton, since which it has been 4 ft. wide, producing a little gold, but not to value. No. 4 rise has been put 19 varas on the lode, and communicated with No. level; the lode 3 feet wide, worth 5 dwts. of gold per ton. A stope in back of No. 2 level, on the north part of the lode, has been stoped 46¼ varas; lode 5 ft. wide, worth 4 dwts. of gold per ton. A stope in the back of the same level, on the south part of the lode, has been stoped 7 varas; lode 4 feet wide, worth 7 dwts. of gold per ton. We have put up a new rise west of No. 1 rise 13 varas, on the south part of the lode, and is available for stoping this part, and we hope this month to prove the extent of the rich nail on the south part of the lode. A stope in the back of No. 1 level has been stoped 26¾ varas; the lode is 5 feet wide, worth 4 dwts. of gold per ton. No. 1 level has been driven on the lode 34¾ varas; lode 4 ft. wide, and showing a little gold. We have put up a rise in the back of the same level; the lode is 3 ft. wide, but of little value. We are daily expecting an improvement both in No. 1 level and in the rise in back of the same. The number of tons of quartz sent to the stamps is as follows:—From San Antonio, 431 tons, yield 4⅔ dwts. of gold per ton; from East San Benito, 910 tons, yield 4½ dwts. of gold per ton; in all 1341 tons=304·700 ozs. of gold.—JOHN TONKIN, WILLIAM EVANS, DANIEL TONKIN.

PACIFIC.—The directors have received the following telegram from Capt. A. Prideaux, their superintendent:—"We have reduced 20 tons of ore with the Manhatton Company, which have produced $650 net."

— Feb. 6: During the past week the mine yielded 15 tons of ore. We also shipped from the mine to the mill as follows:—1 ton 1330 lbs., value $850 per ton; 2 tons 800 lbs., value $230 per ton; 850 lbs., value $60 per ton; 1 ton 1385 lbs., value $700 per ton; 2 tons 37 lbs., value $200 per ton; and 2 tons 1300 lbs., value $160 per ton.—Batters' Ledge: Since my last we have here intersected a very rich ledge, which is on an average 14 in. wide for 12 ft. long, this being the length it is at present opened. Shortly after cutting this lode we sent 1 ton 1330 lbs. of the best to the mill, which yielded near $700 per ton, and 2 tons of the poorer ore, which gave about $200 per ton. This is rich silver ore, as the same was sent to the mill without being assorted. In the meantime we are making the necessary preparations to extract this ore on a larger scale. The ground on the ledge that has not been worked is east of cross cut 500 ft. long, west of cross-cut 1000 ft., above the cross-cut 700 ft. long, and below the cross-cut no ground has been worked. Besides these there is the Buel North Star and several other good ledges, most of which have been worked but very little. All other parts of mine are without any particular change to remark. Some of the tributers are extracting very rich ore.

ECLIPSE.—Mr. Henry Tregellas (under date Jan. 17) reports the produce for two weeks, or the first division of January, is about $1503. This is derived from the same kind of ore as stamped the last clean-up—from the large heap at the dump. They are now stamping the quartz that is coming out of the mine at this time. They had only one grinding-pan at work till to-day. They now have three, with two others to fix up, making five altogether. They now be able to treat a larger amount of concentrated tailings, of which they have a great number of tons on hand. The lode in the 300 ft. level is 6 ft. wide, producing at this time about one-half of its size of milling rock, the lode being very changeable. The stopes above this level is turning out quartz that will be remunerative. In the 220 ft. level they will commence to morrow to stope for the silver and galena ores. The smelting-works are completed, and the fire lit to dry the masonry, and hope in a few days to be smelting. The machinery runs well, especially the turbine, which answers every purpose intended. On Feb. 3 Mr. Henry Tregellas further reports—Owing to severe storms and frost the mill has been idle for several days, and is still idle. The operations at the mine are without change to notice, except that in stoping for silver and galena ores on Bluett's vein they have a good vein of those ores, and if the same be continuous they can supply the smelting-works with a constant amount of smelting ores—further developments will prove this: 58 tons have been taken to the furnace, and shall commence smelting on Feb. 5. The machinery gives satisfaction, the new grinding-pans run well, and in fact so do all other works so far as completed, and when fully so he has no doubt of their success.—[The directors have received from the mines, through their agents, Messrs. Bolton, Guthrie, and Co., of San Francisco, five bars of gold, valued at $1500.]

— Feb. 6: I am happy to tell you that we started up our smelting-works yesterday, and to-day telegraph you the following:—"Serious delays by storms now going well. Smelting silver ores; large quantity on hand. Furnace well yielding well. Will forward $25,000 silver monthly." Also the following:—"Favourable report mine division sent. Send locomotive, track 2 feet wide." The delays by storms were explained by the report on the 3rd. inst. I have now to say that in stoping Bluett's vein it looks well, but the question of its holding on can only be proved by development, and that the six miners at work on it will tell. Our smelting-furnace works well so far, but I very much fear the roof of the roasting-furnace will not stand so strong a fire; but at Cerro Gordo they have a fire-stone that *has* stood a year, and looks better than when first started up, and I have the promise of the same stone if required, and in case our furnace fails I will post off and get the stone. Our mill, while I write, is still idle, but will, I hope, commence to-night or to-morrow morning. The locomotive is to run on a track two feet within. N.B.—The boiler should lay horizontally, and by no means should it have or be driven by gear-wheels. It should have a strong and effective brake, because the first half-mile from foot of mountain to mill is on a grade of (say) 90 ft. to the mile at least. The whole engine complete ought to weigh as much as three tons. I have enquired officially of three makers in this country, and the lowest is $3030. Booth and Co. told me verbally $1000, but wrote me two weeks ago that it would cost $3000. I will write again next mail.

PINTO (Silver).—The directors have received from their mines 22 bars of silver, the value of which is about $1720.

SNOWDRIFT (Silver).—The directors have received advices from Mr. Ernest Le Neve Foster, their engineer, that 10 tons (American) of silver-lead ore have been sent off from the mines, averaging about 200 ozs. of silver to the ton. This, with the lead, will probably be worth 60l. per ton.

BIRDSEYE CREEK (Gold).—J. A. Stone, Feb. 31: Everything is now running smoothly. The weather thus far has been warm and favourable for mining. A great quantity of rain has fallen, and if an average quantity of snow falls in the mountains the season for water will be long and prosperous.—Necce and West: I shall clean up in a few days, and will telegraph on the result at the time I telegraph results of Uncle Sam. The old workings of this claim still seriously retard operations in blasting. Brown's Hill is running steadily night and day; I shall clean up the fore part of next month. Uncle Sam is now running steadily; but since the last clean up there has been some delays caused by heavy rains and sliding of the high bank. I believe, however, that I shall do better this run than the last. One cave came down and covered my foreman entirely over, and partially covered two others. One man's leg was broken; the other two were not seriously injured. I shall clean up when the blocks will stand running no longer—probably ten days or two weeks.—Tunnel: I am now trying to let a contract of 200 ft., and if successful shall require it to be run with three shifts of eight hours each, working the 24 hours.

MONTE ALBO.—March 2: Su Ergiolu: The new shaft has been suspended for a few days, to enable us to drive off the No. 5 levels, north and south from shaft, which was commenced last evening. The lode in the northern end will yield ½ ton of ore per metre, and in the opposite end ¼ ton per metre for size of the level; there is a part of the lode standing in the footwall, to what extent I have not yet been able to ascertain. Stopes Nos. 1 and 2, in the back of No. 4 level, will yield ½ ton per metre each. A considerable change has taken place in Julius Cæsar cross-cut since the date of my last report, and I think we are approaching the Lucifer lode. Lode B, in Julius Cæsar level west, is at present poor. In driving from this level, on lode A, the lode is about 4 ft. wide, composed of quartz and white iron, and producing occasionally some stones of ore. In the rise in the back of the Napoleon level the lode is poor. The stope in the back of this level will yield ¼ ton of ore per metre. The Galleria North is still being continued, but the lode is small and poor. The stope in the back of this level will yield ¼ ton of ore per metre; the ground is very hard for stoping.

BATTLE MOUNTAIN.—In consequence of the block on the Pacific Railway the following reports from Capt. Richards have only just been received:—Jan. 25: Bishop's winze, sinking below the 113 ft., or bottom level, is down 35 ft., and the ground therein is composed of iron, quartz, &c., and as yet shows no improvement. The 113 ft. level cross-cut south is in hard iron pyrites, slow of progress; this has been set at $8 per foot, we providing all material, &c., and board. I hope for an improvement here. In the 113 and 73 ft. levels north no ore is being met with, and the men are removed for the time, taking down sides of the drifts, which is producing some good ores. In Thomas's rise, in the back of the 73 ft. level north, there is some green carbonate of copper, and promising. In the stopes in the back of the 113, north and south of Roach's winze, the lode produces a fair quantity of ore. In the 73 south, near hanging wall side, nothing has been met with, and the men are put to bring forward all the ore we can: 223[illegible] sacks have been shipped at San Francisco, per Glory of the Sea, and 450 sacks have been raised during the past week.

— Feb. 1: Bishop's winze has been sunk 35 ft. since my arrival, at present with no ore, but traces of silver. The 113 cross-cut, east of the Virgin shaft, is suspended, and the men placed on other work. The stopes in the back of the 113 ft. level, north of Roach's winze, have materially fallen off in quantity and quality. The stopes in the back of this level, south of Roach's winze, are turning out fair quantities of ore. The 113 ft. level north is suspended, and the men are placed to open up stopes in the back thereof, at Truscott's winze. Other men are blasting out the eastern side for proof of lode, and raising some good ore therefrom: 365 sacks raised during the week.

LUSITANIAN.—March 5: Palhal: The lode in Taylor's engine-shaft, sinking below the 150, is worth 2 tons of ore per fathom.—Basto's Lode: In the 150, east of Taylor's, the lode is 9 feet wide, composed of quartz and country, with carbonate of lime. In the 150 west the lode is 3 feet wide, worth 2 tons per fathom. The rise above the 150 is holed to the winze No. 90, and next month we shall commence stoping east of the winze, where the lode yields 2 tons of ore per fathom. In the 140 and 130, east of Taylor's, the lode is 5 feet wide, composed of quartz, and in the 140 west 1½ ft. wide, made up of flookan and quartz. In the 110, east of River's shaft, the lode is 2½ feet wide, unproductive. The lode contains a little ore in the 90 east, and also in the 70, where the lode is 6 feet wide. The lode in the adit level, west of Perez's shaft, is 2 in. wide, carrying some good stones of ore.—Mill Lode: In the 38, east of Taylor's, the lode is 1½ foot wide, composed of quartz and flookan. The branch in the 38, west of slide lode, is very small and poor, and the ground very hard. In the 120, east of River's shaft, on Basto's lode, the lode is 4 feet wide, composed of quartz. The slide lode in the 130, south-west of Taylor's, is 1 foot wide, composed of flookan, and in the 130 in the opposite direction, 8 in. wide, of the same character. In the rise above the 90 against No. 89 winze, east of River's shaft, the lode is worth 1½ ton of ore per fathom. In winze No. 91 below the 140, east of Taylor's, the lode is 3 feet wide, worth ½ ton per fathom.—Carvalhal: The ground in the 60 fm. level cross-cut is a hard gneiss.—Great Lode: In the 60, east of Incline shaft, the lode is 1 ft. wide, composed of quartz. In the 50 east the lode is 1½ ft. wide, worth ⅛ ton of lead ore per fathom. The lode is of no value in the 30 east. In the 40 west the lode is spotted with lead. The lode in the 20 east is divided into small branches of quartz, but letting out more water than usual. The adit level, west of Incline shaft on the slide, is in harder ground, the lode is 1 foot wide, composed of flookan and schists. The rise above the 10, on caunter lode, is unproductive. In the 20, north from caunter lode, the lode is 4 feet wide, yielding stones of lead and blende. The 30 is going west, on a lode 2½ feet wide, composed of rusty quartz and mundic.

PONTGIBAUD.—March 2: Roure Mine: The 80 metre level, south of Agnes's shaft, yields a little ore, and looks promising. The 80 fm. level cross-cut, towards Virginie's lode, continues in hard sparey ground. The 60 metre level south, on Virginie's lode, yields ½ ton of ore per fathom; the same level north yields ¼ ton, and the rise above yields saving work. The 40 south is producing ½ ton per fathom, and the same level north ¾ ton. The 20 south yields stones of ore irregularly, but the 20 north is unproductive on both parts of the lode. The lode in the adit north yields 1 ton of ore per fathom, and in the adit south a little saving work. The mill adit south has opened some good ground during the last month's driving, but is now not quite so good; it continues to open tribute ground; the same level north yields stones of ore.—La Grange: The 100 metre level north, on the western part of the lode, yields a little orey work, and opens tribute ground of low quality.—Mioche: The winze in the 20 yields about ½ ton of ore per fathom; the adit winze is unproductive. We have two tribute pitches, yielding some pretty good ore.—Labrousse: Basset's shaft, sinking below the 120, continues rather hard. The 120 south yields ¼ ton of ore per fathom, and the 100 south 1 ton per fathom. The rise in the back of the 100 gives ½ ton per fathom. The 80 south continues on a hard, coarse lode, yielding ¼ ton per fathom. The rise behind this end yields ¾ ton per fathom. The 60 fm. level south is in a kindly lode, yielding orey work; the lode where being undercut behind this end in 15 ft. wide, yielding 3 tons of ore per fathom.—Pranal: The 70 north is unproductive. The same level, on the eastern part, yields ¼ ton per fathom. The 70 south is in a good lode, worth 2 tons per fm. The 50 north is poor. The 30 south has entered a change of ground, and will, we hope, soon enter orey ground. The 8 metre level, on No. 2 lode, is poor, but the same level on the western part of St. Mathew's lode yields some good ore. St. George's shaft is holed to the rise from the 50, and we hope to complete it to that level this month.—Surface: The weather having been fine during the past month our dressing has gone on without interruption. Our samplings have amounted to 290 tons.—St. Amant: The 25 metre level, north of Susan's shaft, is in a lode 4 ft. wide, containing carbonate of lime, spotted with lead ore. The rise behind this end has met with old workings at 15 metres above the back of the level, showing that our predecessors took away what ore they could in the bottom of the adit level. The 25 metre level south is unproductive.—Labrugire: The Monlin adit level yields stones of ore and barytes. At Laplanche the lode has been deranged by a slide, which we hope may have but a temporary influence.

[For remainder of Foreign Mines see to-day's Journal.]

GALVANIC BATTERY.—In the improved battery invented by Messrs. PREVOST and BARJON, of New York, the zinc element is made conical, while the carbon element is made in the form of a cylindrical cup closed at the bottom, and provided at or near its top with a ring or collar of gutta-percha or India-rubber, in such a manner that by the conical form of the zinc element the effect of the exciting liquid in the vase is materially increased, and by the gutta-percha or india-rubber collar on the cup-shaped carbon element, the evaporation of the exciting liquid contained in the said cup is counteracted, and the carbon element is protected against injury from coming in contact with the edge or corner of the zinc element, and is also insulated from the zinc element, if it should be brought in an oblique or eccentric position. This invention also relates to a liquid for galvanic batteries, made by mixing a solution of bichromate of potash with a small quantity of lime, and with sulphuric acid.

UTILISING BLAST-FURNACE GASES.—The invention of Mr. J. DE LANGLADE, forgemaster, of Paris, relates to the treatment of the gases evolved from blast-furnaces, and to the application of the same to the heating of recuperatory-furnaces, and to other heating purposes, also to apparatus employed therein, and consists essentially in causing the said gases to pass through a regenerator, such, for example, as Siemens' regenerator, and in washing and purifying the said gases by causing them before entering the regenerator to pass through an apparatus specially constructed for the purpose, which at the same time ensures the said gas or gases being supplied to the furnaces where they are to be burned at a uniform or nearly uniform pressure. The feature of novelty which constitutes the invention of Mr. A. Barclay, of Kilmarnock, for the same purpose is the leading off of the waste gases from blast-furnaces, by suitable passages to assist in the coking of the coal, and admixed or not with air to assist combustion.

London: Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors), at their office, 26, FLEET STREET, E.C., where all communications are requested to be addressed.—*March 16, 1872.*